SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XVIII.—No. 16. [NEW SERIES.] NEW YORK, APRIL 18, 1868. $3 per Annum [IN ADVANCE.]

Improved Machine for Stretching and Winding Woolen Cloth.

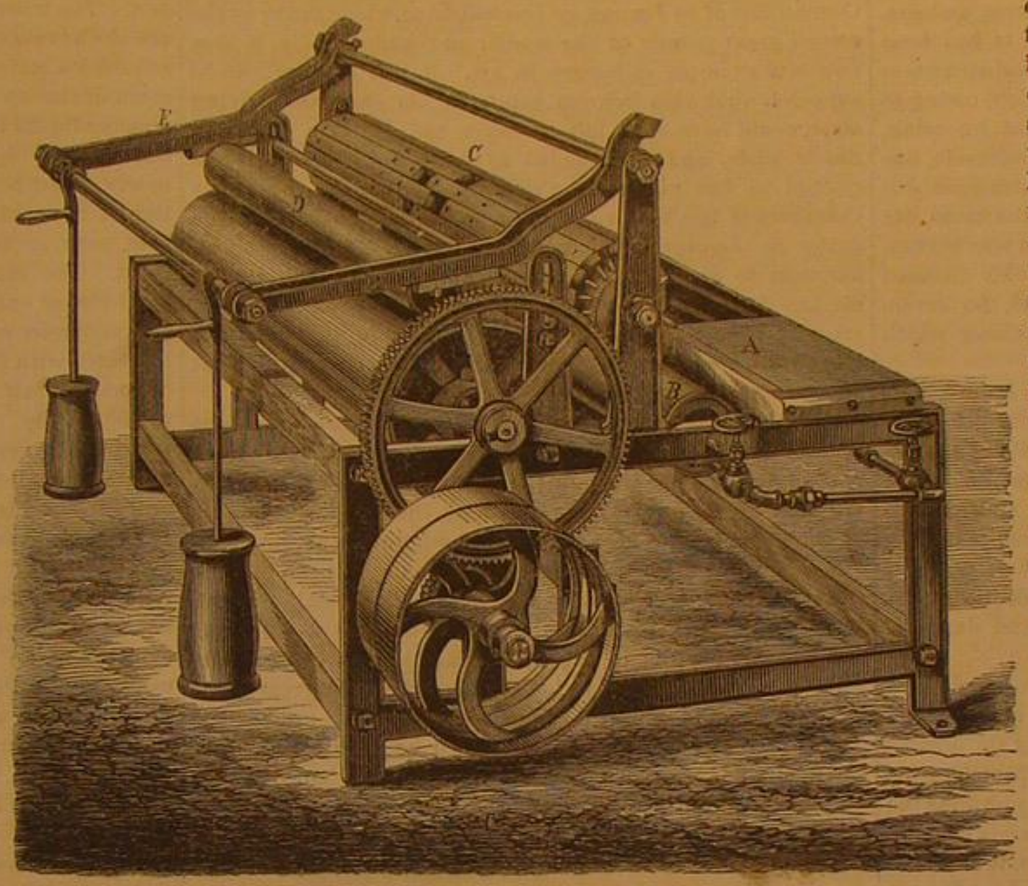
All woolen manufacturers are more or less troubled by their goods becoming "cocked" or "mill wrinkled" in the process of manufacture, and the object of the inventor of this machine has been to cure this difficulty. This machine removes all these imperfections, and brings out the cloth perfectly smooth and even, obviating at the same time any annoyance from tight and slack "listing," which is sometimes found to be a detriment to woolen goods in finishing.

The mode in which the machine is used will easily be understood by those skilled in the business, and a brief explanation will suffice. All fulled goods after being washed, and the water thrown out by the hydro-extractor, should be run through this machine, and the steam applied—more or less as is required—heavy cloths requiring more steam than light ones. The cloth should then remain on the rolls over night, and by this method all sponginess will be prevented, a much better felt will be secured, causing it to be firm without diminishing its length or width, and enabling the finisher to produce a very fine, even face.

A is a trough in which is a coil of steam pipes which are perforated to moisten the cloth as it passes over said trough. B is a stationary hollow copper cylinder, heated by steam introduced by a pipe. C is an extension roll which draws the cloth lengthwise and removes mill wrinkles and cockles from the same, and can be so adjusted as to stretch the cloth as much or as little as required. D represents the roll on which the cloth is wound, as it passes from the extension roll. E represents the arms which hold the roll on the drum, and are adjustable to broad or narrow goods, being weighted as shown in the engraving.

It has been usual heretofore to subject the cloth to the action of the gig after the fulling; and in order to stretch the cloth widthwise and remove the mill wrinkles and cockles, it has been usual to apply temples upon the wrong side of the cloth as it goes through the gig. An attendant is required to raise these temples as they pass the teasels, or else the cloth will be wefted when pressed upon by the temples. Neglect of the attendant often causes cloth to be injured in this manner.

This machine has been adopted by some of the leading manufacturers in the country. It was patented Dec. 3, 1867, and is for sale by Harwood & Quincy, 25 Bromfield street, Boston, Mass., to whom all orders should be addressed.



FRINK'S PATENT CLOTH WINDER.

Improved Hat Band Buckle for Holding Railroad Tickets.

While it is a trouble to the railway passenger to be compelled to fumble in his pockets after passing every station, to find his ticket for the convenience of the conductor, it is also a trouble to the latter. But many travelers refuse to observe the direction printed on the ticket, "Keep this in sight," because of the defacement of the hat and the danger of losing the ticket by placing and replacing it in the hat band, which may be loose.

BURTON'S PATENT SPRING BUCKLE.

In the engraving is seen a style of spring buckle which will firmly hold any slip of paper placed between its jaws. The buckle is as elegant in appearance as the ordinary buckle and may be made of any form, as seen. On the square buckle the side uprights are double, the lower ends of the outside pieces being secured to the main portion and the upper ends being curved slightly outward, for convenience of placing the ticket in place. On the oval buckle there is but one holder, it being parallel with the upright bar in the center. These holder strips are springs, so that they effectually hold the ticket in place.

Patented through the Scientific American Patent Agency March 10th, 1868, by J. N. Burton, who may be addressed for rights for manufacturing or for territory, at Senoia, Coweta Co., Ga., or his agents, J. M. Keep & Co., No. 8 Dey street, New York city, will answer all communications.

To Toughen and Refine Gold.

This invention has for its object the toughening of brittle gold bullion, and the refining of alloyed gold whilst in a melted state, together with the separation therefrom of the silver they may contain. This is effected by means of chlorine gas, brought in contact with the alloyed gold when the metal is in a molten state. In this manner the silver present, and any baser metals which render the gold brittle, are converted into chlorides, whilst the gold remains in a purified and tough condition.

The crucible is heated in a furnace, and the gold is melted in the usual way, with a small quantity of borax. The crucible has a closely-fitting cover, with a small hole bored through it; and when the metal is melted, a fire-clay tube of, say, three sixteenths of an inch internal diameter, is inserted through this hole, so as to dip into the molten gold down to the bottom of the pot. The upper end of the tube is connected, by a vulcanized india-rubber pipe, with a glass or stone-ware vessel, in which chlorine is generated. The joints are tied round with wire, and the india rubber is protected from the direct radiation from the fire. The chlorine generator is fitted with a safety tube, say six feet long, dipping, at its lower end, into the liquid in the generator, and the liquid stands in this tube to such a hight as is equivalent to the pressure necessary to force the gas through the melted gold which is above the end of the fire-clay tube. The current of gas through the metal is maintained for about three hours, and the metal may advantageously be agitated, from time to time, by stopping the flow of the gas for a moment by pinching the india-rubber pipe until the pressure ceases, and then allowing the accumulated gas to pass suddenly. At the end of this operation the gold will be nearly pure, and the chloride of silver formed will be floating on its surface, together with such other chlorides as may be formed, and which are not readily volatilized. The contents of the crucible may be poured out all together into moulds, so as to form ingots; and the chlorides are, in this case, detached from the surfaces of the ingots when they are cold; or, by preference, the metal is allowed to cool in the crucible until it sets, and the still liquid chlorides are then poured from its surface into a mould, so as to form a slab.

The borax is, in this operation, retained in the crucible, and in this no difficulty will be found, as it is much less fluid than the chlorides. The crucible, still containing the gold, is at once replaced in the furnace until the purified gold is again melted, and it is then cast into ingots.

The chloride of silver, and the other chlorides mixed therewith, are reduced to the metallic state by one or other of the processes commonly employed for this purpose. Patented by Francis Bowyer Miller, Sydney, New South Wales.

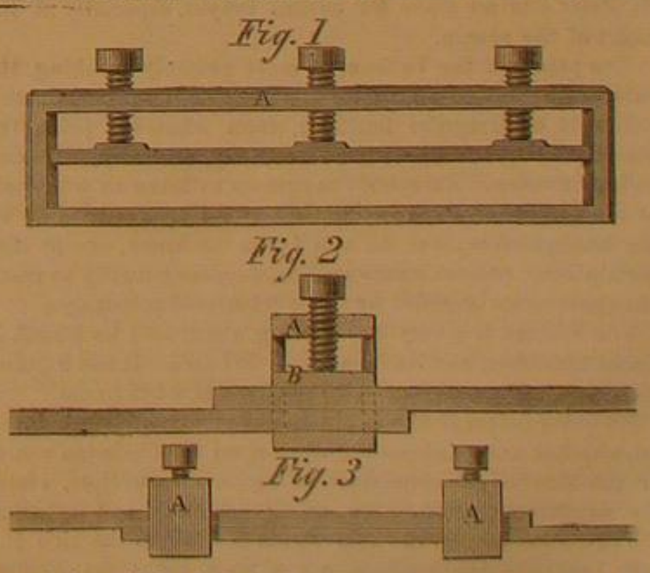
Composition Oil.

The nature of this invention relates to utilizing the waste from paper mills, said waste being the liquid which runs from the bleaching apparatus, and which, in combination with certain oils, produces a composition or an oil to be used as a substitute for linseed oil in the various preparations of paints, putty, and cement, or for all the purposes for which pure linseed oil is ordinarily used, for painting, etc. The following is a full and complete description of the ingredients, and manner of compounding the same:

This liquor or waste is subjected to a process of cleansing, by filtration or otherwise, if intended for fine work. With this liquor is compounded, in about equal parts, according to the strength of the liquid, linseed oil, or other oils of an analogous nature, or with the distillates of petroleum. This fluid or waste, when mixed with linseed oil in about the proportion above said, forms a thick semi-transparent fluid or oil, which may be thinned down to a proper consistency for painting, by the use of turpentine or benzine, in the ordinary way, and which, of itself, forms an excellent varnish, which soon dries, having a hard, glassy surface, and fire-proof. This composition readily combines with the various pigments, as white lead, zinc, ochres, and other coloring materials ordinarily used for painting, making a hard, durable, glassy, and fire-proof paint, which can be laid on with a brush with the same facility as the best linseed oil paint, and at little more than one half the expense. This oil, when combined with whiting and lead, makes a good putty for glazing, much stronger and more tenacious than ordinary putty, and will not crack and peel off by exposure to the weather; and when used simply in combination with lime, it forms a strong, hard cement, or stone-like substance, which, for roofing purposes, when made of a proper consistency, can be spread on with a trowel, on tin, sheet iron, or paper. This coating soon becomes as hard and strong as slate. Recently patented by William Ward of Cleveland Ohio.

THOMAS' PATENT BELT COUPLING.

The design of the device illustrated in the engravings is to obviate the necessity of lacing belts, and to provide a ready means of taking them up when slack, and loosening them when too tight. Its simplicity is apparent at a glance. Fig. 1 is a front or face view of the improvement: Fig. 2 a vertical transverse section, and Fig. 3 an end view. It is simply a flat, rectangular collar, A, in one piece, having, sliding within it, a clamping plate, B, the ends of which are slotted to fit projections on the inside of the band. This clamp bar is forced down on the belt by three or more set screws, according to the width of the belt, the sizes of the clamps or coupling being adapted to the different widths of belts. Its method of application is shown plainly in Figs. 2 and 3.



It is well known that leather belts contract and expand with changes of temperature, at times being too slack to drive well, and again so tight as to be strained. Also, if a belt of the proper length breaks by the tearing out of the lacing holes, a piece must be put in to make up the required length, which is a process requiring considerable time. The intention of the inventor of this device is to provide against both these contingencies. To accomplish this he overlaps the ends of the belts, as in Fig. 3, and places a clamp on each end. The belt can thus be taken up or let out very quickly and effectively.

Patented through the Scientific American Patent Agency, Feb. 11, 1868, by John L. Thomas, who may be addressed relative to the sale of the entire right, or of territorial rights, at Alliance, Ohio.

EDITORIAL CORRESPONDENCE.

Dangerous Places in Rome—St. Peter's—The Vatican—Sculpture—Statue of Augustus Cesar and other Ancient Worthies—Pictures—Raphael and Domenichino—Fashionable Driving on Monte Pincio—Heretical Churches—Carnivals in Italy.

NORTHERN ITALY, March 2, 1868.

Previous to the recent unhappy outbreak in Italy the revolutionists in Rome had succeeded in some stealthy way in mining several buildings in the city, but fortunately no mines were fired, except under some barracks near to the Vatican, which were reduced to ruins, several soldiers being killed or maimed by the explosion. A theater, standing near the bridge of St. Angelo, was pointed out to me as one of the spots under which the infernal train had been laid; and it was feared that even St. Peter's might be blown to flinders, therefore an order was issued shutting up the crypt, also the gallery leading to the dome. I said to the guard that it would scarcely be possible for evil disposed persons to inflict serious damage upon the church, even if they were allowed to ascend the dome; but, he said, some one might throw out a false flag, which would be looked upon as a bad omen.

It does not seem to me possible that any one could be found sufficiently depraved to attempt to injure a building so noble as is St. Peter's. Apart from its religious character, and considered merely as an architectural monument, it has been criticised and praised as one of the most wonderful structures ever erected—not on account of its exterior, which, owing to its unfavorable situation and surroundings, is not imposing, but chiefly for its immense size—for its famous colonade, fine front, vast interior, and truly majestic dome, which rises 405 feet above the pavements, or, to the top of the cross, 448 feet. It will be remembered that Michael Angelo was eighty-seven years old when he finished the dome. He declared that he would lift the Pantheon in the air; and, for seventeen years, he gratuitously directed an undertaking which had enriched some of the earlier architects.

It is difficult to believe that the dome of St. Peter's is as large as the Pantheon, but such is the fact—the difference being very slight. One peculiarity about St. Peter's is noticed by every visitor, viz., the equable temperature, which is said to be nearly the same the whole year. Churches in Europe, during winter, are usually cold, comfortless places, and are not improperly regarded as the sepulchres of unacclimated strangers. I believe that many visitors expose themselves to premature death by the chill and damp of these churches.

The first impression of the size of the interior of St. Peter's is always disappointing; but this feeling wears away after a few visits, when the visitor has had time to study its details, and wander about its naves and chapels. The Spanish cathedrals are pervaded by a rich, solemn gloom; they impress the mind as religious sanctuaries, where devout people come to worship God; but the leading churches of Rome, it seems to me, awaken no such impression. The interior of St. Peter's is warm, light, and cheerful; its fine mosaic pictures, its splendid monuments, and its numerous array of marble statues, some of which Dickens has described as "breezy maniacs," together with the multitude of strangers with the inevitable Murray in hand, and the paucity of worshipers, make the place seem more like a vast museum than a church.

It is remarkable that the attendance upon the ordinary religious services of St. Peter's is very slim, owing to the fact that the Catholic people of Rome do not relish the prying and intrusive curiosisy of so many strangers. It is frequently noticed that persons who kneel to pray have their attention drawn off by stylish ladies who sweep along dressed in the latest Paris fashions. I think I am correct in saying that St. Peter's is no place for devout prayer, especially in the hight of the season.

The palace of the Vatican, or more properly speaking, the palaces of the Vatican, adjoin St. Peter's. They constitute a vast pile of irregular building, from whatever point the view is obtained. There is no harmony, no unity, all seems to be confusion. Everybody is curious to know in what part of the edifice the Pope resides, and where Antonelli takes up his headquarters; but no one seems to know, except that certain long, tedious stairways are supposed finally to reach the apartments occupied by these celebrated personages.

The Vatican is a very bewildering structure; its length is about 1,200 feet, and its breadth is 767 feet. It has 8 grand staircases, 200 smaller ones, 20 courts, and 4,422 rooms.

No other palace in the world approaches it in historic interest, whether as regards its influence upon the Christian world, or the marvellous collections of books, manuscripts, statuary, paintings, and other objects of ancient art and learning.

Take, for example, the apartments devoted to the rich library, enter the grand saloon, not a book, not a manuscript, not a scrap of paper to be seen. The ceilings, side walls, and presses, are all most profusely embellished. Pass into the long gallery, 1,200 feet long, and here also is the same liberal adornment. Nothing else visible, excepting some very rare and costly objects of art—the books being all carefully concealed from public view. I doubt if any other palace in the world posses es rooms of equal size and splendor. The Pope lives and rides in imperial style. I can descr be nothing in very minute detail, but the statuary and sculpture of the Vatican alone is the finest collection in the world.

Nothing that I have seen in Rome has so much impressed me as to stand in front of the statues of the Cesars, Scipios, Trajan, Titus, Nero, Cicero, Marc Antony, Lucius Verus, Marcellus, Marcus Aurelius, Septimus Severus, Demosthenes, and other great names, and to feel that these statues were modeled after their living forms.

The particular statue that interested me most was that of Augustus Cesar, found in 1863 among the ruins of the villa of the Empress Livia, on the Via Flamminia, about eight miles from Rome. So very perfect was this statue that few restorations were needed. It is of fine Greek marble, nine feet high, and is considered the finest likeness in existence of the great Roman emperor, of whom Christ said: "Render unto Cesar the things that are Cesar's;" and, when Paul was accused before Agrippi, the king answered: "If this man had not appealed unto Cesar he might have been set at liberty." The figure is very noble. It represents Augustus in the vigor of his manhood, carrying upon his left arm the Roman scepter, his right arm gracefully extended, as if in the act of delivering an address. Here is also a full length portrait of Demosthenes, one of the noblest works of antiquity, of which Rome possesses an exhaustless store of riches.

I was quite disappointed in the picture gallery of the Vatican, as, from remarks made by enthusiastic travelers, my mind was made up for something wonderful in art. The famous collection has three inferior Murillos, presented to the Pope by the Queen of Spain,—the Spaniards hold fast to Murillo's best works. Here is also the Transfiguration of our Lord—the last great work of Raphael—the power and beauty of the picture being somewhat marred by another artist, who painted the arms of the "demoniac boy" of unnatural size. There are other good Raphaels also. The Communion of St Jerome, by Domenichino, which ranks as the second great picture of the world; and, undoubtedly, it is a powerful example of nature in art. But it is hardly to be supposed that this beloved saint, in his emaciated, dying state, could have been left to suffer and die in a condition nearly nude, and surrounded as he was by his brethren, clothed in fine raiment. Certainly, winter, in the chilly chambers of the Vatican, is not a good time to look at the dying St. Jerome. The whole collection of the Vatican amounts to about fifty pictures, some of which appeared to me indifferent works. I do not profess, however, to be an art-critic; but I claim the privilege of judging for myself what suits me in art, in spite of the criticisms of proficient writers on such subjects.

The palaces of Rome are very numerous—there are about seventy-five—some of which are historically famous. Such is the Lateran, once the papal residence, now given up to a museum of antiquities; the Quirinale, the summer residence of the Pope, famous also as the place where the cardinals assemble during the conclave, to vote for and elect the pontiff; the private palaces of the Borghese — Barberini, Corsini, Doria, and Farnese—all contain good collections of paintings and statuary; while in the Spada Palace is to be seen the colossal statue of Pompey, "at the base of which great Cesar fell." Upon the immediate environs of Rome are several fine private villas; also, a spot known as Monte Pincio—a small, circular space, somewhat larger than the tent of an ordinary circus, but affording a fine view and a charming promenade and drive—a fashionable drive occupied chiefly by English and Americans, who ride round in hired carriages to look at each other. After three or four turns around the Pincio—which can be made in fifteen or twenty minutes—the whole thing begins to appear ridiculous, and one after another of the carriages draw off to a side stand, or depart for the grounds of the Villa Borghese, or on some of the other pleasant excursions about Rome. To have a genteel standing, however, in Rome, one must drive every pleasant day around the Pincio, in a carriage that can boast no number painted upon it.

Cardinals, robed in their long, scarlet cloaks, and broad-brimmed hats, are usually to be seen upon all the principal promenades and byways about Rome. Their carriages are very heavy, and are drawn by a pair of black horses, with driver, and two very clumsy-looking footmen standing up behind. When the cardinal gets out to walk, these footmen follow at a respectful distance. The universal custom is to bow to the cardinals, a civility which is always very graciously returned.

With the exception of the Jewish synagogues, the pontifical government tolerates no church other than Catholic within the walls of Rome. The chapels of the heterodox legations—those, for instance, of Russia and Prussia—must be concealed from public view. The Episcopalians and Presbyterians have their places of worship, but they are situated outside on the Via Flammina, in a building which has no ecclesiastical appearance. Indeed, if I mistake not, there is a wine and beer shop on the corner, next to the English chapel entrance. Religious intolerance, however, is rapidly giving way throughout all Europe—Rome being now the only exception, in a somewhat modified form; for certainly the authorities have it in their power to drive away all public establishments of an heretical character.

The government was very anxious that the Romans should be highly amused this year, therefore it put forth extra exertions to render the carnival a day of festive fun and amusement. It opened very well, as I can testify; but apart from the, to me, novel horse-racing down the Corso, the sport seemed to be carried on by strangers, who displayed a great deal of vigor in throwing *confetti*, sugar plums, and bouquets, to fair Roman girls, who appeared in the balconies to invite such attention. There were comparatively few fanciful costumes, either guilty of having taken part in the recent revolution, or suspected of active sympathy therewith. At Leghorn we saw something more of the carnival; at Bologna the great procession occurred the day we left; at Venice we enjoyed an old-fashioned Venetian carnival for six days; at Milan we had another experience of three days; and we arrived in Turin the last day, and just in time to see the procession before it broke up; so that we are tolerably well instructed in the nature and character of Italian carnivals.

S. H. W.

Animal Electricity.

Recent experiments have confirmed the theory that animal electricity does not owe its origin to the formerly imagined action of the nerves or muscles, but emanates directly from a purely chemical source, the exciting cause being generated by the contact of the air with the incipient decomposition of the freshly killed animal. Bearing in mind that a liquid but very slightly saline, in contact with animal substance, is an electrometer, it is easy to perceive that the so called muscular current is nothing more than the current produced by their contact. To put beyond a doubt the question that a live muscle would generate electricity, which it could not produce when dead, contact has been made between the muscles of a live animal and the wires of a galvanometer, without the latter evincing the slightest sign of an electrical current. Moreover, if a portion of muscle be separated from the body of an animal freshly killed, and placed in communication with a galvanometer, a feeble degree of electricity is demonstrated. According to the opinion of a member of l'Academie Francaise, this is due to the influence of oxygen upon the flesh, a cause always existing when the muscles retain their normal state of irritability. Assuming that animal electricity was due to the cause surmised by Galvini, the evidence of the current would cease so soon as the muscles become completely inert, or, so to speak, completely dead. But the reverse is the fact. The more decomposed the flesh becomes the stronger are the advances of its electrical condition, and when it has acquired a state of almost total putridity, it imparts the maximum deviation to the astatic needle. That the presence of a saline liquid is necessary to these electrical effects, is proved convincingly by several circumstances. One is that meat newly salted becomes electrical in proportion to the penetration of the solution, and the other that cured meats, whether beef, pork, or fish, evince a high state of electrical development. The blood of a living animal is altogether destitute of electrical excitation, but becomes capable of affecting the galvanometer so soon as the animal is killed, and its power increases with the putrefaction of the body. A small addition of common salt to the blood immediately increases its electrical sensibility. If the epidermis of an animal be removed, the underlayers of cuticle are highly electrical, as the experiments upon frogs have demonstrated, and this condition is still further augmented by the addition of a saline solution.

From these results we are justified in assuming that animal electricity in its original symptoms is a delusion, and that without the intervention of some slight saline liquid the nerves and muscles are *per se*, powerless to afford the smallest evidence of an electrical current. Unless a chemical action can be set up there is nothing to indicate the presence of that vital muscular agency which the first experiments in connection with the subject led the older philosophers to insist upon and adhere to. The animal current, which they so fondly propounded and believed in, is simply an ordinary electrical current produced chemically by the contact of a saline solution with animal matter, in which combination the salt acts the part of the electrometer. Adopting this view of the question, it is easy to perceive that the development of animal electricity, in invalids and diseased organs, instead of being due to the cause originally entertained, is solely the consequence of chemical decomposition. Thus, for instance, the mucous membrane of the mouth becomes electrical in patients suffering under disease of the stomach or digestive organs, and strong evidences of it are manifested in malignant, cancerous, and other ulcers of a dangerous and fatal type. All animal excretions are electrical, and urine possesses this property in so remarkable a degree as to cause the needle of a galanometer to make a complete revolution of the dial. The electricity of fishes results from an alkaline solution in the cells of the electric organs, and manifests itself very powerfully. All the effects of animal electricity may therefore be regarded as closely resembling those of fermentation and putrefaction, and to depend not upon any muscular or nervous hypothesis, but solely upon an incipient chemical decomposition in combination with chemical electrometers.—*The Engineer.*

Packfong and White Metal.

The *Journal of Applied Chemistry* says:—Packfong or Pakfong or Tutenag, is an alloy, known by these names among the Chinese, and is composed of nickel and zinc, of each seven parts, and copper five parts. Another quality, known by the same name, but more malleable, is composed of nickel, fifteen parts; copper twenty-one parts and zinc twenty-eight parts. Both these alloys are sometimes called Chinese white copper, and are nearly the same as German silver. We give several formulæ for the latter:—Nickel and zinc, of each one part; of copper two parts. This composes the finest quality. For rolling, nickel, twenty-five parts; zinc, twenty parts; copper, sixty parts. For castings, nickel and zinc, of each twenty parts; copper sixty parts; lead three parts. The original German silver is made from copper, forty parts; nickel thirty-two parts; zinc twenty-five parts; iron three parts. All the above are used as substitutes for silver, to which they are in many cases preferable for durability.

New Mode of Preserving Eggs.

Joseph Blakeley, of Bordentown, N. J., has patented the following:

"I take an egg in its natural condition and divest the integument thereof of its mineral portions [he means in plain English that he dissolves the shell] by immersing it for a sufficient time in dilute acid, as acetic acid for instance, after which I wash the egg in cold water, for the purpose of cleansing it from any acid that may adhere. I then dry it *in vacuo* at a low temperature. When the egg is to be used it may be laid in cold water for a few moments, when the integument can be readily removed, and the egg can then be used."

STEAM BOILERS---THEIR CONSTRUCTION AND USE.

We make the following extracts from an address delivered recently before the Institute of Technology, in Boston, by Mr. J. A. Miller, a practical engineer and boiler maker of New York city. Many of his ideas if not new are quite suggestive:

One hundred years ago last November, Watt completed the first practically perfect steam engine. It may be fairly asserted that for the first fifty years its introduction was only in an experimental manner; when we consider that in 1812 the first steam engine in the New England States was erected in the city of Providence, for the Providence Dyeing Bleaching and Calendering Company, on the very spot on which the boiler now stands. What wonderous revolutions have not been effected by this mighty engine in a half a century. Fifty years ago a commission of the greatest scientific men of the day reported to Napoleon I. that the application of steam to the propulsion of vessels was a visionary and an impractical idea. Yet, in the short span of time, the steam engine has become so important to mankind, that if by some sudden chance men should be deprived of its use, the greater portion of the people on the civilized globe would be plunged into want and misery, and a large portion would surely die of starvation.

Yet this mighty steam engine is only as the lever, or any other mechanical device. It is not the source of any power, contains no power within itself; but is simply an instrument to apply the power generated in the boiler. The engine being the more showy and attractive part, has received all the care and attention that could be lavished upon it, whereas the steam boiler is left to the narrow notions which daily routine so frequently engenders. Mechanically constructed by a boiler maker, it is considered safe, perfect, and will pass inspection if it be only tight and able to stand a given pressure. That the steam boiler is far behind the engine, can be easily understood; when we consider that the best engines made will realize from eighty to eighty-six per cent of available power out of the power applied from the boiler. How is it with the boiler? The percentage of available power produced by the combustion of fuel averages for wood five, for bituminous coal seven, and for anthracite coal eight and a half per cent. When we consider that we get, at best, less than one tenth the power out of our fuel, in the best boiler in use, we can easily appreciate how much can and must be done to bring the boiler on a level with the engine. That the steam boiler can be made to give within a small fraction the whole theoretic power as well as the steam engine, and that it can be made as safe as a water wheel, can only be doubted by those that have never held sweet communion with nature, and admired the beauty and perfection of her laws. That steam boilers at present are not safe, is a lamentable fact, that they can be made safe, I have repeatedly proven. All that is required, is to make the construction of steam boilers a separate branch—not in a mechanic sense; but let scientific men study the laws applicable to steam, in all its relations, and soon the day will come when well defined laws govern its construction. At present, there has been no attempt at system, and many of the causes of its rapid destruction, although well known, are constantly ignored. Incrustation; that greatest source of boiler destruction, it not for one moment considered, but left to injurious powders as a remedy, when the disease is much easier reached. Nothing is done to insure circulation of the water, so as to carry the steam, as soon as made, into the steam space. Priming is only considered when the boiler proves useless on this account. There is nothing done to protect it against sudden strains which so disastrously weaken boilers. No, the boiler is simply made tight, as to the rest, it is left to chance or good luck; and yet, if it explodes and kills, maims, and carries destruction to all surroundings, the burden is laid on some mysterious cause, beyond the control of engineer or owner.

When, in a boiler, we find some attention paid to conveying the heat generated in the furnace into the boiler, we will be sure to find the question of evaporation completely set aside. When a boiler foams, or makes wet steam, a steam dome is carried up around the chimney, or the heat is carried over the top of the boiler, or a super-heater is used. All of these have been found useful and beneficial, yet they are at best but remedies—after thoughts—and, when not wrong in themselves, show conclusively that there is something seriously wrong in the boiler. Such remedies are on a par with the cobbler who, in trimming, cut the uppers of a pair of shoes and then charged at once for mending the new shoes. The plainest evidence that steam boilers are built without regard or knowledge of the natural laws applicable to the production of steam, lies in the lamentable fact that more than four hundred and twenty different forms of boilers are made, each claiming some superiority over the others; and, strange to say, not without some show of reason. Another fact, and one, I hold, fully demonstrating the lamentable state of ignorance in all that relates to vaporization, is that a boiler, and one of the latest improvements, claims to be so strong that it cannot burst under any practical steam pressure! Now what would we think of the intelligence of an individual, who having lost some gunpowder by explosion, would have his powder kegs bound with strong iron hoops, or would the Pacific Mail Steamship Company carry nitro glycerin if put up in spheres tested at 600 lbs. to the square inch. The cause, it must be evident, still remains; and the effect would be worse. If we wish to make powder non-explosive, we mix some foreign matter with it, and thereby prevent the conditions under which explosions take place; we do not strengthen the receptacle. If we would have boilers safe we must do the same, and not resort to the doubtful expedient of simple strength.

A steam boiler tested and built to work under a pressure of 80 lbs., is worse than a powder mill, if under any circumstances that pressure may be increased accidentally, even one pound. An English writer on this subject says: "It is a truism that the strength of any structure is its weakest point," but who can say where the weakest point of a steam boiler is; as ordinarily made. Some will say the safety valve is an efficient remedy, while others contend that the same has been found wanting in many cases; both parties are right. A steam generator in the true sense of the word, one that will make dry steam without superheating in any manner, one that will simply change the cohesive force of the water into the repellant force of the steam, and leave the water a dense mass free from steam, such a steam generator wants only a simple and reliable safety valve. But a regular steam boiler (we had better call it a water boiler), wants more, or rather to make it perfectly safe under all circumstances, wants—well, it wants to be kept cool.

I have for years made heat and steam my specialty. I have experimented during that time on a pretty large scale, and on all kinds of boilers. I have examined forty-eight exploded boilers carefully, have conversed and compared notes with practical men at home and abroad on this subject. I believe that I understand this subject as thoroughly as Professor Agassiz does anatomy, and I am learning, laboring, reading, and investigating daily, yet I own, that the more I search the more clearly I comprehend the laws that lie at the root of the production of steam, the more I marvel not that steam boilers explode, no, but rather that they do not explode more often. When on a steamer I hold my life worth but little, when I think that there is a power, and a more dangerous power, stored in the boilers, than could be in a hundred powder kegs; when I think that this power is under the control of men knowing nothing of its laws, and little more of its nature, than the children in New York did, who threw a piece of conglomerated powder (dropped by a careless cartman in the street) into the fire, causing the loss of four innocent lives. Tell this man of his great responsibility, of the number of lives placed in his hands and dependent on his skill, and he will point to the glass gage, if such a thing is used at all, considering that all is done that can be done when the water is at a sufficient hight. And yet there are many cases on record, where it is known beyond a doubt, that at the time of explosion the water was at its proper hight. So great, in fact, is the fear of low water, that I do not think one engineer in a thousand ever lets his water get low enough to cause danger from that source. There are many boilers so constructed that the water actually changes place with the steam, or where the water is lifted out of the lower, or water leg, and is forced into the steam room. To such an extent does this take place at times, that water is found in the upper gages.

Are such steam boilers safe? Are they constructed for any definite object except to boil water?

Let an inspector examine such a boiler, and he will subject it to a certain cold-water pressure, and certify to its capacity. Now I will here make the assertion, that there are plates in most boilers which are subject to a higher strain empty, without any steam pressure in the boiler, than they are under a hundred-pound pressure. The construction of our boilers at present depends on so many faithful or faithless, sober or drunken, skillful or ignorant men, on whom the contractor does, or must depend, that no man can be for one moment responsible for their safety.

If a steam boiler were made of a flexible material, in the same manner as they are made of boiler iron, it would present a curious shape and puckered seams, but the iron allows the boiler maker to hammer it into shape. Each sheet is stretched and pulled and hammered, sometimes more than the iron can stand, and the sheet is taken out, torn and rent, before the boiler is completed.

All this is wrong, and the sooner we leave off forcing and compelling unfit material to assume an unnatural shape, and perform unnatural functions the better.

All things in nature or art to be perfect, must be graceful and harmonious. The strongest beam we can cut out of a tree will be the most agreeable to the eye. A steam engine that works silently, smoothly, you need not ask, but be sure it works well. The same is true of gearings, railroads, and all other machines, tools, or other things that move; a graceful motion is a sure indication of speed in a horse, or any other animal, the one that moves most gracefully, moves with the least expenditure of force. It is a fundamental law, that perfection, harmonious operations and economy, go hand in hand.

Here, one word about the safety valve. It is too frequently the case that a number of boilers are connected by one steam pipe, and that for convenience sake, the safety valve is placed so remote from the boiler that it can, under no conditions, be more than a simple pressure gage, wholly inadequate to carry off any steam, that may from some cause, be rapidly forming in the boiler above the working pressure. Directly on the boiler, and that on each boiler, is the proper place for a safety valve.

If we lift the safety valve on a cylindrical boiler made of a glass tube, we will at once see the water suddenly rise like a wave—we see in both ends the water fall and all flowing toward the center. If not sufficient steam pressure is stored up in the water, we see it suddenly return to its level, and observe a violent agitation of the water. If an engine is attached to the boiler, we see the same agitation at every stroke.

Is there no lesson in all this? If not, do not all explosions happen, either at the moment the safety valve is rising, or when the engine is either started or taken fresh steam, or when dye beeks or tanks are suddenly connected? We have hundreds of well authenticated cases to prove this. As there is no circulation in the water, and as most water contains some impurities, the water can be heeted to a higher degree of temperature than corresponds with the pressure of the steam, if we now, by opening a valve, cause a local relief of pressure, the water nearest the valve first rises, then suddenly falls, causes agitation of the same, and a sudden relief of large quantities of steam, which, if the boiler is weak at any one spot, causes rupture, and this rupture causing additional relief and additional generation of steam, causes the explosion.

Imitating Cluster Jewelry.

"'Cluster work,' or that style of jewelry which, in the form of breast pins, buttons, earrings, etc., consists of an aggregation of small stones arranged in a cluster, is commonly made by mounting each stone, or its glass imitation, in an appropriate plate, furnished with as many settings as there are stones, each stone being held in the grasp of its appropriate setting by the friction of the edge of the latter against the surface of the stone. In the manufacture of genuine work this method is the only one practicable, on account of the small size and high value of the jewels employed."

The present improvement applies only to the manufacture of imitation cluster jewelry, and consists in having the "jewels" all made in one piece or plate of glass, the "jewels" being raised on the glass plate, forming bosses. The setting is also made in one piece of metal—a sort of net work, filling the spaces between the bosses.

Recently patented by W. O. Draper, A. C. Sweetland and G. H. Draper, of North Attleboro, Mass.

Mechanical Decoy Bird.

"My invention is designed to supply cheaply, to gunners, a means for causing, at will, a motion of the wings of a decoy, to attract the attention of flying birds; and it consists in the combination, with the body of a decoy, of wings which are made to move by a line or lines leading from the body of the decoy to the gunner, so that he can, at will, by pulling on the string or strings, cause a movement of the wings, which will attract the attention of flying birds." Patented by Nathaniel Wales, Boston, Mass.

Science Familiarly Illustrated.

Curious Things About Frost.

One morning in October I found all the tomato and pumpkin vines used up and killed by frost, but the bean vines, the potatoes and the cabbages in my garden were in fine order still. Three weeks after the frost came again, and not finding any tomatoes and pumpkins, he laid hold on my pole beans and my potatoes. They became black and died as if strangled. An old farmer said that this frost that killed the potatoes was a "real black frost."

"Ha!" said I, "black frost and white frost—do they ever mix?"

"You watch and you'll see the difference," said the old farmer.

And I began to watch. The cabbage in my garden was not killed yet. The chickens have a wonderfully good time nipping off the edges of the big, tough leaves. Well, I watched to see what the frost would do next. One morning I noticed that the bridges and the board walks were white as snow, but the dirt roads, gravel walks and stone sidewalks could not show a single speck of frost. And I saw that there was no frost on or near the spikes in the board walk, but were spots instead.

Yet I remember, on one winter day about noon, when things were thawing a little, that the board walks all dried off, leaving a spot of frost on each spike, and all the stone walks and dirt roads were cold and hard as ever with snow and ice! Every fall the boards become frosty, while the spikes and stones are warm and wet. Every spring the boards are warm and wet, while the spikes and stones are frosty! Funny frost!

One day the good woman who cooks for us, made some doughnuts, some folks call them fried cakes (they are good no matter what you call them), and when she had done frying them, she set the hot lard out at the door, by the side of a basin of water, to cool. The lard and the water both froze solid that night, and the next morning I saw the frost had made a hollow in the lard and a hump in the water Frozen lard shrinks, frozen water swells! Funny frost! how you do. And out in a barn on a beam, I had one bottle with castor oil in it, to oil my carriage wheels, another with neatsfoot for my harness, and another bottle full of water. They all froze up solid, one cold night, and the water bottle split, but the others did not.

Off the coast of Newfoundland and Nova Scotia, sailors often meet with icebergs a hundred feet high, and all the books say that there is nearly as much ice under the water as there is above. But, when I went skating on our canal, the ice lay all of it on top of the water, and none of that was under water at all. And yet, when I break off a piece of ice, and put it in a pitcher of water, it floats just like an iceberg, six times as much under water as there is above it.

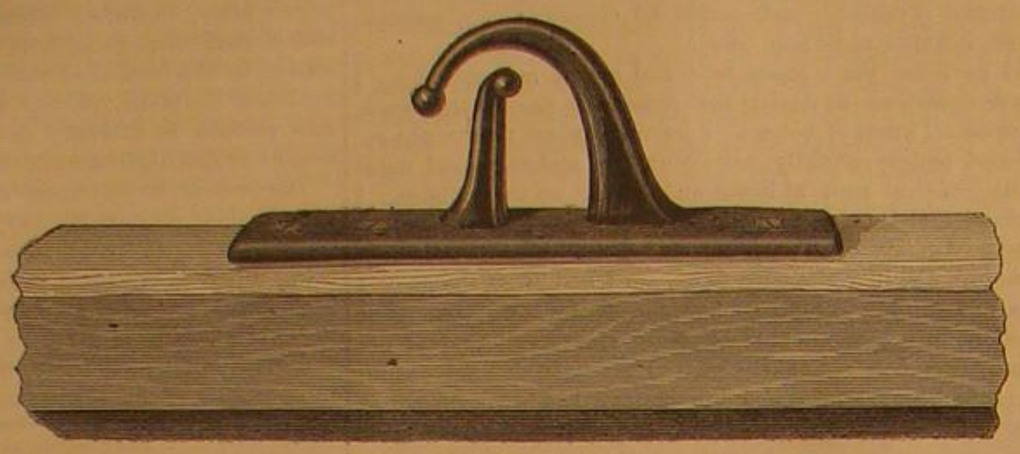
An Indian was found dead by the roadside, one very cold morning, with an empty rum bottle beside him. He was frozen stiff. The wise Indians came and examined to find what had killed him. They decided that there had been too much water in his rum, and the water had frozen hard and killed him. Rum never freezes, but men with rum in them freeze more easily than other men who drink water only. Queer, funny frost again.

These are only a few of the curious things that frost has set me to thinking of. If any one of the readers can explain all these curious things, they will be wiser than some professors in our colleges. And professors are the wisest people I know of.—*Little Corporal.*

Improvement in Holdback Hooks.

The device seen in the accompanying engraving is a combination of a post with a thill hook, intended to prevent the breeching straps from becoming accidentally unfastened, and still to offer no obstruction to their removal when desired. It is neat, and even ornamental, and its proportions give great strength with lightness. The base or plate is secured to the thill by screws, and is sufficiently long to give a good bearing, while it acts as a brace to the shaft instead of weakening it, as is often the case with other forms of hooks. It may be used either on the upper or under side of the shaft or thill.

This device was patented through the Scientific American Patent Agency, Feb. 4, 1868, by N. W. Robinson, who will dispose of state rights, or sell the whole patent. He may be addressed at Moriah, N. Y.



ROBINSON'S PATENT THILL HOOK.

Tar Pavement Cement.

The following, patented by Albert M. Shaw, of Lebanon, N. H., differs but little from the ordinary tar cements in common use.

"I melt together tar (either coal tar or Carolina tar), Albert coal and resin, mixed in the following proportions: one hundred gallons of tar to fifty pounds each of Albert coal and resin, the same being thoroughly mixed while melted. If my pavement or flooring is laid upon the surface of the ground, I take pebble stones, sufficient to cover the surface to be paved a depth of three inches, and saturate the said stones with the above-named mixture in a heated state, and spread said pebbles over the surface to be floored to the proper depth, and roll the same down. I then take sufficient gravel to cover said surface to the depth of about one inch, and saturate the same with the same mixture, and spread it evenly over said pebble stones to the requisite depth, and roll it down. I then take sand sufficient to cover my surface to the depth of one inch, saturate the same with said mixture, and spread it evenly over the gravel coating, and roll it down smooth, and leave the same to harden. If a fine and smooth surface is required for rooms, I use ground slate instead of sand for my finishing coat, and in rooms where the flooring is not laid directly on the ground, I dispense with the lower stratum of pebble stones."

Improved Process of Purifying Iron and Steel.

This invention consists in an improvement in the manufacture of iron and steel, by what is known as the pneumatic process, the object being to carry off the sulphur, phosphorus, and other impurities from the metal, which are not removed by that process, as ordinarily conducted. This result I effect while the metal remains in the converter, and without subjecting it to a process of reheating. Pig metal, or crude iron, which results from the process of deoxidizing the iron ore by means of a blast furnace, is highly carbonized iron, with which are mingled silicon, sulphur, phosphorus, and other impurities. The atmospheric pneumatic system consists in the removal of the excess of carbon from the metal, by subjecting it, while in a molten condition, to the direct action of an atmospheric blast, for the purpose of burning out the carbon, without the use of separate fuel for supporting combustion and producing the requisite heat. The melted crude iron is poured into a receiver, or converter, at a pressure of about 3000° F., and a blast of atmospheric air at a pressure of about twenty pounds to the square inch, is forced through the melted metal, entering at or near the bottom of the converter, and permeating the mass of molten metal therein. The mechanical effect of the passage of air through the metal is to produce violent ebullition and commotion, and the chemical effect is that the oxygen of the air unites with carbon of the iron, generating a great increase of heat, and causing a vivid combustion, the carbon of the iron serving, together with a portion of the iron, as a fuel, and the carbon being thus burned out and removed. During the process, which ordinarily takes about sixteen minutes, the heat of the metal rises rapidly, to about 5000° F., and as soon as the carbon is all consumed the blast of air is stopped, as otherwise a rapid oxidation of the metal would ensue.

This process, which is successfully employed in the manufacture of steel from crude iron, does not effect the removal of the sulphur and phosphorus, which are eliminated, if at all, by a subsequent and distinct operation. It is proposed to effect the removal of the sulphur and phosphorus from the iron while it is yet in the converter, and before it has been allowed to cool, by means of carbonic acid gas, either applied as a separate blast, immediately after the cessation of the atmospheric blast, in the pneumatic process, or by combining carbonic acid gas with the atmospheric air in that operation.

The carbonic acid gas employed in this process may be manufactured by the action of muriatic acid upon limestone, in a suitable apparatus, when it is desired to use the gas pure; but where it is employed in combination with the nitrogen of the air, it may be conveniently procured by means of a generating oven, which consists of a close arched chamber, furnished with grating, forming a bed for coke or charcoal, which, being ignited, a stream of atmospheric air is forced, by a fan, into the closed space under the grating, or fire bed, and the air, passing through the ignited carbon, combines with it, and is converted into carbonic acid mingled with nitrogen, and is conducted to the blast cylinder.

The operation of this improvement is as follows: The atmospheric pneumatic process, as ordinarily practised, is carried on substantially as before described, the valves being set so as to force atmospheric air through the melted metal in the converter. This is continued until the carbon is nearly all removed, which will be usually in about sixteen minutes, the time varying in practice with each charge of metal, according to its heat when poured into the converter, the quantity of carbon which it contains, the pressure of the blast, and other variable causes. As soon as the process of decarbonization is about completed, stop the blast of atmospheric air, and by means of the valve force a blast of the carbonic acid gas through the melted metal in the converter. This blast is continued for half a minute, more or less. Then, again, change the blast, admitting atmospheric air, which is continued for about fifteen seconds, when the blast is stopped, the operation being complete.

The result which is accomplished by this improvement may be briefly stated thus: The blast of atmospheric air being continued through the molten iron until nearly all trace of carbon has disappeared, on the introduction of the carbonic acid gas a chemical union is formed between the two equivalents of oxygen and the sulpher present in the iron, forming sulphurous acid, which passes off as gas, depositing the carbon thus set free, which may be expressed thus: $C O_2 + S = S O_2 + C$. A similar result takes place in respect to phosphorous present as an impurity in the iron; the oxygen of the carbonic acid combines with the phosphorous, evolving acid gases of phosphorus, and depositing carbon, thus, $2 C O_2 + P = P O_4 + 2 C$, and carbon is deposited. This deposit of free carbon may be left in the iron, if preferred, in the manufacture of steel, or it may be burned out after the sulphur and phosphorus are removed, by a repetition of the atmospheric blast for a few seconds, as before stated. The oxygen of the carbonic acid gas will also combine with the iron, forming ferrous acid, thus, $C O_2 + Fe = 2 Fe O + C$, the formation of the protoxide of iron setting free and depositing the carbon.

In practice, it will be found that the sulphur and phosphorus will first be expelled, and that what little carbon is deposited, will either be blown off by the blast or current of air or gas, or will unite with the ferrous acid, reducing it to iron, and forming carbonic oxide, which will be evolved as gas. While the blast of carbonic acid gas is passing through the molten iron, the temperature of the metal will fall somewhat, losing almost one fourth of the additional heat gained during the passage of the atmospheric blast. This, however, is rather an advantage than otherwise, as it is found that by the atmospheric pneumatic process, the iron is rendered almost too fluid by the extreme heat. If preferred, the carbonic acid gas may be heated before entering the converter.

A modification of the process which I have described, consists in allowing a small proportion of carbonic acid gas to enter the blast cylinder, together with the air, and thus subjecting the molten crude iron to a combined blast of atmospheric air and carbonic acid gas. By this means the impurities are removed by the process of decarbonization. Other gases or fluids may also be introduced, together with the carbonic acid gas, as may be desired. Patented by John F. Bennett, of Pittsburgh, Pa.

Easy and Cheap Modes of Enriching the Soil.

A discussion on this subject lately held by the Bedford, N. H., Farmer's Club, is reported by the Manchester *Mirror:*

Mr. Buswell, of Auburn, gave the result of plowing in green clover, which was very satisfactory. The plowing in of a crop once in five years kept the land in a high state of fertility.

The chairman (Colonel George W. Riddle) remarked that a crop of green clover upon an acre, estimated at a ton after it is cured, would be worth, standing, $10 for hay; if turned under, would be of as much value as a fertilizer as four cords of stable manure, costing $48. He considered it the best and cheapest method of enriching the soil.

John A. Riddle read a paper in regard to a new system perfected by practice in a foreign country, by a scientific agriculturist. By the use of soil of known capacity (sand), he succeeded in rendering it fertile by the application of the four well-known fertilizers: saltpeter, potash, phosphate of lime, and lime. Combined in known proportions they constituted a complete manure; with either omitted the whole was inoperative, or the results very much reduced. With one, the phosphate of lime, omitted, it was found to be impossible to produce vegetation, showing it to be absolutely indispensable, as by the addition of a trace, one one-hundred-thousandth, the plant would live. The addition of lime affected the result only ten per cent, but *humus* (vegetable mold) being added to the sand it increased forty-five per cent, although the *humus* without lime has no effect. The use of the complete manure in conjunction with complete manure less one and another of the constituent elements, would show the farmer which of these essentials his soil contains or lacks—as, if the soil contained the one omitted, its omission would have no bad effect on the succeeding crop; if it was lacking, the crop would show it.

A gentleman present stated the analysis of a fair average of barnyard manure, by Dr. Nichols, editor of the Boston *Journal of Chemistry*, and a practical farmer. It was found that, assuming a cord of manure to weigh 3000 lbs., nearly 2500 lbs. of it was simply water, more than 100 lbs. sand, and more than 300 lbs. of the balance of no more value than muck, straw or chaff—leaving only 74 lbs. of active fertilizing material, which might be carried in an ordinary basket upon the shoulder to the field. Barnyard manure may be imitated by thoroughly composting with a cord of seasoned meadow muck, 65 lbs. of crude nitrate of soda, two bushels of wood ashes, one peck of common salt, ten pounds of fine bone meal, two quarts of plaster, and ten pounds of Epsom salts. It will not cost $3.50 the cord, and ought to serve as good purpose as animal manure.

Effect of Bright Red on Animals.

We have never yet been able to arrive at a solution of the curious effects of the sight of scarlet or brilliant orange or crimson on some animals. No treatise on natural history we ever have seen has given a satisfactory explanation of facts which must often have been noticed by the most unobservant. An exchange says:

"Many persons have unquestionably lost their lives in consequence of wearing articles of dress which provoked domesticated animals to such a pitch of fury as to lead to melancholiy results. Females, for example, in attempting to cross a pasture, wearing a red shawl, a red covering for the head, a scarlet dress, or flowing scarlet ribbons, where bulls are grazing hazard their lives. Oxen, otherwise peaceably dispossd, become intensely infuriated at some seasons by the sight of bright red handkerchiefs, or almost any article of female dress of that particular hue. It is equally curious that turkeys manifest the same restlessness and ultimate excitement at red flags or red dresses. The turkey cock on such occasions assumes extraordinary dignity, gobbling most uproariously, and creating immense excitement in his family, not accustomed to the sight. Nearly all the wild grazing animals exhibit extreme surprise, if not positive fright, when a red cloth floats before them."

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Bridge Piers and Floating Ice.

Messrs. Editors:—As you were kind enough to publish some remarks I made a few days since, respecting canal navigation, etc., I will, at the risk of fatiguing your readers, submit some suggestions as to the best method of building bridge piers in streams where large masses of floating ice run at certain seasons of the year. You are undoubtedly aware that bridge piers are usually built with their up-stream face, or cut-water, at an angle of not over twenty degrees from where the inclination or bevil commences to the top of the pier. With this slight angle, a field of ice will press upon or strike the pier with as much force as though it stood perpendicular to the surface of the water. If the piers are sufficiently strong to withstand the first field of ice, those which follow either mount upon or slide under it, until a perfect dam is erected, which floods the adjacent country, to the great destruction of property, as is too often seen. It is not unfrequently the case that piers give way, taking bridge and all with them, as recently reported of the Rock Island railroad bridge, at Davenport, Iowa. All this can easily be obviated by building the piers with their upper, or cut-water face, at a greater angle from the perpendicular. If that angle is made at forty-five or fifty degrees, and the cutting face is contracted to a moderately sharp edge, and is built from a few feet below "low-water mark," with a reasonably hard stone laid so as to present the appearance of a "flight of stairs," with the steps from twelve to fifteen inches high, by about three inches deep; an "inclined plane" is made, on which the thickest fields of ice will be forced. When the ice slides upon this "stone saw," if I may so call it, its weight will naturally cause it to crack; but when the cutting of the "saw," as the current drives it on, is added to the tendency to break, there is nothing to prevent its being torn asunder and passing down stream on its harmless way.

A little reflection will show that a considerable portion of the force of the ice is nearly vertical upon the plane of the pier, which rather holds it in its place than otherwise; while the steady, sliding motion up the plane prevents any shock whatever to the pier itself. The first piers of this kind were built by the late Mr. Stevenson, for the Victoria Bridge at Montreal, where the St. Lawrence is nearly two miles wide, and runs fully ten miles the hour. Fields of ice a mile square by from two to three feet thick, can there be seen, at times sawed into pieces or stripes, almost as systematically as though they had been cut for some mammoth ice house.

My object in thus calling attention to this subject is, that as I see your system of railroads is pushing itself far across the continent to the west—your great Mississippi and Missouri rivers will probably be crossed by numerous bridges, it occurs to me if engineers will examine Mr. Stevenson's work at Montreal, when the ice is running in the early spring, they

will need no other argument to convince them of the strength and ability of the pier I have endeavored to describe.

New York city. ENGINEER.

For the Scientific American.

HOW A SNOW FLAKE IS BUILT.

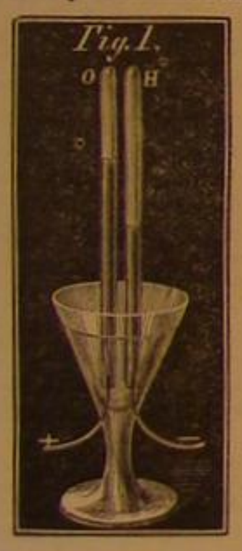
BY PROF. GUSTAVUS HINRICHS.

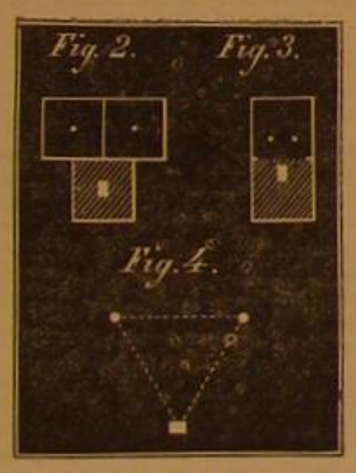
In No. 8 of the SCIENTIFIC AMERICAN (Feb. 22) a beautiful plate of snow flakes is inserted in the report of the admirable lectures of Prof. Tyndall on heat and cold. The figures, although of course but a very poor imitation of the actual beauty of the snow flakes, nevertheless will enable the numerous readers of this journal to understand how Tyndall in the same lecture can say: "Snow is one of the most wonderful and beautiful things in the whole world."

I believe that Kepler, the great astronomer, is considered the first who called the attention of scientific men to their beautiful and most regular form. Since then they have been studied very accurately; many hundred plates filled with the various forms observed have been published. But never has the cause of these forms been satisfactorily accounted for in a simple manner; indeed the explanation of these forms has hardly ever been attempted. Still, every one in beholding these forms, cannot help being convinced that they are the expression or the result of some grand universal law, just as the spherical form of the heavenly bodies is the expression of the law of gravitation.

In my "Atomechanics," published last year for distribution to the various institutions of learning in this country and in Europe (see the London *Mechanics' Magazine*, Dec. 27, 1867)) these forms find their simple explanation in connection with the other crystalline forms exhibited by matter everywhere. It may not be without interest to give a somewhat more detailed, simple account of this explanation here. The explanation is based upon the known chemical composition of the substance itself; and as this may not be sufficiently plain to all of the readers, we shall present a concise account of that also.

Snow is crystallized water. But what is water? By passing a galvanic current through water, Nicholson and Carlisle discovered in 1800 that water was decomposed into two different gases. Fig. 1.) The gas collecting above the positive pole was found to support combustion; a glowing taper immersed into it bursts into a bright flame; hence it is oxygen. At the negative pole there collects a gas which burns with a pale bluish flame, producing water again as the result of this combustion; it is therefore hydrogen. Furthermore, it is readily ascertained that for every one measure of oxygen





produced in the one tube, O, there are exactly two measures of hydrogen evolved in the tube, H. Water is by this experiment proved to consist of oxygen and hydrogen in the proportion of one measure of the former to two measures of the latter. This has been represented in Fig. 2, where each measure is represented by an equal square, and H standing for hydrogen, O for oxygen.

Now matter, bodies, are made up of parts; the smallest parts or particles are often called atoms. The atoms themselves cannot be supposed to change; hence, since the size of the bodies, particularly gaseous bodies, changes very much, expanding and contracting often to an enormous extent, the atoms themselves are considered to be relatively at great distances from one another. Thus in Fig. 2 the two squares represent the two measures or volumes occupied by two hydrogen atoms; these particles themselves actually filling but a minute portion of this space, as indicated by the dot in the middle of the squares. That the spaces between the atoms (or the interatomic spaces, Tyndall, tenth lecture on heat as a mode of motion) are really so great, we may readily understand if we remember that the water atoms contained in one cubic inch of water will occupy a cubic foot, or nearly two thousand times as much space when the water is converted into steam. We meet here the same fact as in astronomy; the space actually occupied by the sun and planets is entirely insignificant as compared to the space allotted to them for their motions; in other words, the universe is not densely populated by either cosmical atoms in the heavens or chemical atoms in any substance. The question, how the atoms manage to keep other particles out of their great domains, is usually answered, by the vibratory motions of heat; the atoms vibrating to and fro so energetically and rapidly that they actually would kick out any neighboring atom that might happen to get within the space allotted to them.

But furthermore, chemists consider it proved that all elementary atoms occupy equal spaces when the elements are in the gaseous condition. Thus the two volumes or measures of hydrogen obtained from the water would represent two particles or atoms of hydrogen; so also the one measure of oxygen will represent one atom of oxygen. In other words, we learn from the decomposition of water by the galvanic current, that each atom of water consists of two atoms of hydrogen and one atom of oxygen.

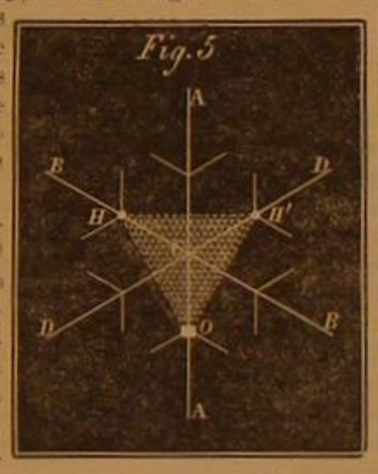
In Fig. 2 these atoms are represented as still uncombined, a mere mixture of oxygen and hydrogen; when actually combined to water-atoms it is known that the three measures have condensed to but two, as represented in Fig. 3. For we know that one volume or measure of oxygen weighs 16 times as much as an equal volume of hydrogen, while water, as steam, weighs exactly 9 times as much as an equal volume of hydrogen. If we call the weight of one measure of hydrogen 1, the weight of one volume or atom of oxygen is therefore 16, the weight of one volume of water—9. But one atom of water, consisting of 1 volume of oxygen (weighing 16) and 2 volumes of hydrogen (weighing 1 each), does weigh 16+2, or 18. Since now, one volume of steam weighs only 9, it follows that one atom of water or steam occupies two such volumes, as represented in Fig. 3. It is readily seen by a comparison of Fig. 2 and Fig. 3, that this chemical paradox, viz., that 2 volumes, H, and 1 volume, O, give not 3 volumes, but only two volumes of steam, may be understood by supposing the two atoms of hydrogen in the act of combination to be brought inside of one volume, which in being placed together with one of oxygen, gives the two of steam, Fig. 3.

In the preceding we have given nothing but the actual facts (excepting the last explanation of the reduction of the three to two volumes). This must enable us to explain the form of the snow flakes.

A snow flake is but a great collection of water-atoms, arranged according to the form of these atoms. What is that form?

We have seen that each water-atom (Fig. 3) is composed of three little particles, two being the hydrogen atoms, the third being an oxygen atom. But three particles always form a triangle (Fig. 4); and since two of these particles, H and H′, or weights are equal, the third, O, will sustain the same relative position to either of them, or the triangle, H O H′, must necessarily be isoceles; that is OH=OH′. And since now the atoms, even when combined, are at great distances from one another, the most complete position of equilibrium will be attained; that is, the equal sides, OH and OH′, will be equal to the base, HH′, or the triangle, H O H′, is equilateral.

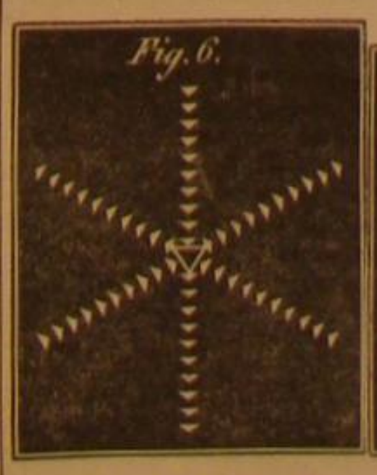
The form of a water atom is therefore necessarily an isoceles triangle, and probably an equilateral triangle. In the latter case it has three equal axes at angles of 60° in the plane of the triangle. This is represented in Fig. 5, where AA, BB, DD, are these three axes, dividing the plane of the water atom equally.



But after having obtained the form of the atom of water, the further question arises: How will the atoms of water arrange themselve when perfectly free to move? It must of course be remembered that they never are actually in contact, for the spaces between the atoms never are nothing.

Suppose, then, there were a great number of water atoms freely moving in space, that is, a space is occupied with little triangles (Fig. 4), the base, H H′, of which weighs 2, the vertex, O, of which weighs 16. They will therefore, under the influence of any force whatever, be directed all parallel to one another. To illustrate this, take equal and equilateral triangles cut out of pasteboard, fix (by means of a little beeswax) one shot at each of two of the corners, but 16 shot of the same size at the third corner. Now let these all drop—that is, be subjected to the force of gravity; all corners with 16 shot, or representing our oxygen corner, O, in Figs. 4 and 5, will point downward, all sides, H H′, will be exactly horizontal. Again, let them furthermore be exposed to a strong current of air: the parallelism of the triangles will remain, though the direction itself will of course depend upon the direction of the blast.

Hence the atoms of water will, when by sufficient and gradually applied cold, they are made to approach one another, be arranged perfectly parallel to one another, and therefore primarily form a simple six sided star. (See Fig. 6).



But any atom in these atoms may again become the center for others, so that forms like Fig. 7 and all other observed forms of snow flakes result.

Even the solid, compact ice is built up in the same way. This has been shown by the beautiful experiment of Tyndall described in his fourth lecture on heat as a mode of motion. In thawing, he showed that similar perfectly regular six-sided stars are formed in the ice.

In conclusion, we will add the description of the snow flakes given by Tyndall in the sixth lecture referred to. By a glance at our figures it will be seen how well our theory accounts for their wonderful forms. Tyndall says:

"Snow, perfectly formed, is not an irregular aggregate of ice particles; in a calm atmosphere the aqueous atoms arrange themselves so as to form the most exquisite figures. You have seen those six-petaled flowers which form themselves within a solid block of ice when a beam of heat is sent through it. The snow crystals formed in a calm atmosphere are built upon the same type; the molecules arrange themselves to form hexagonal stars. From a central nucleus shoot six spicula, every two of which are separated by an angle of 60°. From these central ribs smaller spicula shoot right and and left with unerring fidelity to the angle 60°, and from these again other smaller ones diverge at the same angle. The six-leaved blossoms assume the most wonderful variety of form; their tracery is of the finest frozen gauze, and round about their corners other rosettes of smaller dimensions often cling. Beauty is superposed upon beauty, as if Nature, once committed to her task, took delight in showing, even within the narrowest limits, the wealth of her resources."

But there is still one point more which in this connection may readily be explained. According to my "Atomechanics," an oxygen atom—the part here considered solid, O, in Fig. 4 is composed of a group of 32 little particles; each hydrogen atom consists of only two such particles. Suppose now that the water atom represented in Fig. 4 was exposed to a rapid and powerful current of the ether, which according to Tyndall and modern physicists generally, occupies the space between the atoms. Then the oxygen atoms would be blown away in the direction of the current, just like the chaff is blown away from the grain; in other words, this constitution accounts for the decomposition of water by the galvanic current, the oxygen goes in the direction of the flow, or with the current, because its atoms offer the greatest resistance to that current on account of their structure.

It will be seen from this short exposition that "Atomechanics" explains "how the snow flakes are built up," explains a fact which all philosophers unite in declaring one of the most wonderful and mysterious in nature! And Atomechanics does this not by introducing at every turn some new auxiliary hypothesis; but by means of only one principle, that all elements are composed of one substance, pantogen. Perhaps we may at other times present some other points of Atomechanics to the readers of this journal.

Iowa City, March, 1868.

Improvement in Hand Printing Presses.

MESSRS. EDITORS:—I notice in the SCIENTIFIC AMERICAN of March 21st, an inquiry why there are no improvements in hand printing presses, by Mr. Gabe of Bloomington, Indiana. In reply, I wish to say that the proprietor of the *Gazette* office, at this place, and another gentleman, have perfected a very valuable improvement on hand presses, and it will soon be patented and offered to the public. The proprietor of the *Gazette* has attached the improvement to his double-medium Washington press, given it a thorough trial, and it proves a complete success. It greatly lessens the labor of press work, and doubles the speed of the same. The cost of the improvement is trifling, and it is capable of being attached to all hand printing presses in a few minutes. The patent is now being applied for, through your agency, I believe.

Adriance, Ind., March 23, 1868. K. L.

Improvement in the Manufacture of Molded Articles.

Patented by William B. Gleason, Boston, Mass.

"Having a matrix or mold of the form of the article to be produced, I take thin veneers or shavings and moisten them by hot water or steam. The veneers I lay in the mold, and then press into the space in the mold upon the veneer, any suitable plastic adhesive compound that will afterward set and become hard. The plastic material which is forced by the action of a press into the mold, acts upon the thin veneer as a punch or die, which is the reverse of the mold, and causes the veneer to fit all parts thereof, while, by reason of the plastic nature of the filling or backing, the contact between it and the veneering is made perfect, and at the same time the adhesive nature of the compound insures the union of the facing to the backing.

In some cases, where, from sharp angles or abrupt projections or depressions in the mold, there is danger of breakage or separation of the veneer or shaving, I make use of more than one thickness, which increases the chances of there being at the points of breakage at least one unbroken portion of wood. When the veneered object is dry and hard, all of the shavings, where more than one thickness is used, that come immediately into contact with the filling, will adhere to the filling and the layers not adhering may be removed. I am aware that thin substances have been shaped to form by the action of hard, solid punches, which press such substances into molds suited to the punches, which forms or shells have been afterward backed or filled with plaster or other material. My invention, however, differs from the matter just referred to, and it may be said to consist in the process of forming in molds articles which are covered with an adhering pellicle, by pressing the pellicle into the mold by an adhesive plastic substance or compound, as well as in articles so molded."

Curious Habits of the Chlamyder.

Among the recent French publications is a highly entertaining work by M. Pouchet, Director of the Museum of Natural History of Rouen and correspondent of the Academy of Sciences. The book is a disconnected collection of curiosities in nature, which our author has compiled and published

with the comprehensive title of "The Universe." One of the most interesting parts of M. Pouchet's work is that which treats of the architecture of birds, and under this head appears a somewhat marvellous description of the habits of a peculiar species of the feathered tribes, who apparently prefer elegance of external adornment in their nests rather than shelter for the protection of their brood. The speckled chlamyder is an exotic bird, resembling our partridge, but distinguished from it by its deep color relieved by clear spots, and by its neck, which is adorned with a red collar. For the location of their nest, the couple choose an open place exposed to the sun and to the light. Their first care is to make a path of round pebbles; when they deem it to be sufficiently thick, they begin by planting in it a little avenue of branches. They are seen for this purpose to bring from the country slender shoots of trees of about the same size, which they thrust solidly by the thick end into the interstices of the stones. These branches are disposed in two parallel rows, converging a little in such a manner that they form a miniature shrubbery. The plantation is a yard in length, and is sufficiently wide to allow the two birds to walk alongside of each other in the interior. This grove being finished, they devote themselves to embellishing it. Each starts out foraging in the fields, and brings back all the sparkling objects it can pick up—pearl shells, birds' feathers, all that charms the eye. These trophies are suspended at the entrance to the grove, which soon begins to shine in the sun like a palace of the Arabian Nights. In the places frequented by the chlamders, if a traveler loses his watch, his knife, his seal, he does not spend his time looking for it on the ground; he knows where to find it. The discovery of these facts appeared so extraordinary to Mr. Gould, who first described them, that he feared to meet in Europe only with unbelievers. To answer beforehand all objections, he had one of these wonderful shrubberies taken up, and succeeded in transporting it to the British Museum, where it can be seen to-day. A little later, a living chlamyder was brought to the zoölogical gardens of London. He was placed in a large room in the midst of all the materials necessary for his constructions; but the poor exile only made a shabby work of it. He scarcely touched the branches, to plant a few here and there in a heap of stones. He wanted the air and the sun; he wanted especially a companion.

DISSOLVING ANILINE COLORS.

For the application of most of the aniline colors, more especially blues and violets, consumers are obliged to make use of special solvents either to prepare them for the dye-bath or for printing. The solvents mostly employed are alcohol, wood spirit, and acetic acid. These solvents, seeing the quantity one is obliged to use (from two to five gallons per pound of color), are very costly, and the best means ought to be used either to diminish the quantity employed or dispense with them altogether. Many ways have been proposed. The first consists in modifying chemically the colors, especially blues and violets, by the action of concentrated sulphuric acid or the action of alkali.

The action of alkalies has given birth to the isolation of the bases of violets and blues of aniline and the formation of soluble salts by the saturation of this base with an acid.

The action of concentrated sulphuric acid has resulted in the following processes:

Nicholson heats one part of blue or violet of aniline with four parts of sulphuric acid 66° Baumé to 230° Fah., and keeps it at that temperature till the color is entirely soluble in water; the time is generally about 45 minutes.

C'avel pours (a little at a time) Nordhausen fuming acid upon the colors, stirring all the time. After the repose of half an hour the mixture is run carefully into water saturated by an alkali which precipitates the color completely soluble in water.

M. Monet, of Lyons, mixes one part blue of aniline with one part sulphate of aniline; he takes one part of this mixture or one part of violet insoluble in water, and adds it to six parts of sulphuric acid 66°, heats gradually to 160° Centigrade, takes out the fire, and adds alkali till an alkaline reaction is shown, and the color precipitates. After washing one part of this color is soluble in 200 parts water.

The second means consists in replacing alcohol by vegetable emulsions, or by solutions emulsive of special products much less costly than alcohol.

These means have originated the processes of M. Gaulbier de Clanbry and of MM. Lailler and Dumesnil, of Rouen. The process of M. Gaulbier de Clanbry was patented in England and France in 1864, and according to his patent a large number of substances give to water the property of dissolving the colors which to that time could only be dissolved by alcohol or substances as inconvenient. His invention consists in the substitution for the alcohol and other solvents hitherto employed for dissolving the coloring matters obtained from aniline which are insoluble in water, such substances or any substances which shall possess the property of forming a mucilagenous, gelatinous, or sopanaceous solution when mixed with water, or of thickening water so as to render it mucilagenous, gelatinous, sopanaceous, or sirupy. As examples of such substances, especial mention may be made of the following: Starch or other fecula, gums, gelatine or glue, concentrated decoctions of the bark or rind known in Panama (*guillaya saponaria*) of the rose tribe, the soapwort of Egypt, the root of the marsh mallow, mucilage prepared from the plants or the seeds of the mallow, lily and orchis tribes, from lichens, fucus or sea wrack, and the seeds of the quince. He also mentions that other substances, though not possessing the properties of rendering water mucilaginous, gelatinous, or soponaceous or sirupy may be employed, such as glucose and glycerin. The dyeing is effected by the solutions hereinbefore described, in the same manner as when alcohol is used, but with the advantage in favor of the improved mode of preparation that the solvents do not volatilize like alcohol, and uniformity of tint is readily obtained. In the baths the fibers take up by their own action the colors which remain constantly in a state of solution, and consequently fabrics or fibrous substances dyed by this process do not lose any of their color by friction.

It is said that M. Gaulbier de Clanbry has ceded the working of this process to the house of Coly, of St. Denis. For dyeing or printing this process is probably more adapted to the violets than the blues, and has not yet acquired a very large practical importance except in the manufacture of lakes, to which it appears specially suitable. As a solvent for the aniline colors employed for this purpose gums and glue, etc., have been extensively used for some time in this country as well as in England and France. The process of MM. Lailler and Dumesnil is somewhat similar to the preceding.

The third means was patented in England and France by Mr. Leonhart, of Manchester, in 1864, and consists in reducing the colors of aniline into a state of extreme division and introducing them in this state into the dye-bath without any solvent. To obtain this result the colors are completely dissolved in alcohol. The alcohol solution is run drop by drop into cold water, which is rapidly agitated. The precipitated mass is drained or filtered and well washed and the liquid is distilled to recover the alcohol, which can be used again and the paste can be employed directly in dyeing or printing

The last plan is due to the intelligence of MM. Rangod, Pechiney and Ach Bulard. They dissolve in cold sulphuric acid of 66° blues and violets of aniline, one part of color to six or twelve parts of acid. When all is dissolved this solution is poured into a quantity of water sufficient to determine the total precipitation, about fifteen or twenty times the weight of acid employed. The water must be well agitated and kept cool during the mixing. The precipitate, separated from the liquid and well washed, is used in the state of carmine and is applicable direct to dyeing and printing.

It is well known that the process of Rangod, Pechiney, and Bulard has given excellent results in dyeing quantities of wool, and it is truly inexplicable that the process is not yet generally applied. That the employment of alcoholic solvents, so very costly, is not abolished, is not the want of a means to arrive at the result, but only the non-application of that means.

Editorial Summary.

A New Oil Tester.—For testing the relative value of various oils used as machinery lubricants, there is, as far as we know, no perfectly reliable instrument in existence. Until a recent period the specific gravity alone has furnished a guide in determining the value in this respect of standard oils, but of late years the nearly interminable variety of oils that have been introduced, causes the test to be nearly useless. An English patent has lately been granted for a new apparatus, constructed on the principle that the best oil is the one which allows the greatest number of revolutions to be performed by a shaft with the least possible increase of temperature of the bearings, and that all others may be graded on a descending scale as to value, according as they fail to approach the standard.

Recipes for Welding Iron and Steel.—For welding iron and steel a composition has lately been patented in Belgium, consisting of iron filings, 1,000 parts; borax, 500; balsam of copaiva, or some other resinous oil, 50; and salammoniac, 75. They are mixed, heated, and pulverized. The process of uniting the iron and steel is as usual. The parts are heated to a cherry red, covered with the preparation, brought together, again heated and welded.

Another composition for the same purpose is 15 parts of borax, 2 of salammoniac, and 2 of prussiate of potash. Being dissolved in water, the water should be gradually evaporated at a low temperature.

Telegraphing by Touch.—A correspondent, a telegraph operator, proposes to have the blind taught to read telegraphic signals by touch and sound, and those who are deaf as well as blind by touch alone. His plan appears to be feasible, and this widening of the bounds which now hem in our suffering fellows would no doubt meet the approval of those who have the care of them. We do not think, however, that reading telegraphic signals by touch is novel; as we have several times seen the feat performed. But its introduction into our deaf and dumb asylums would be a work of mercy. The apparatus, as our correspondent shows, would be simple and cheap, and it might be applied to a variety of uses.

A Valuable Fossil.—Professor O. M. Marsh has secured and presented to the Yale College Cabinet, probably the largest fossil elk in existence. Some sixteen years ago, there were imported from Ireland the fossil remains of four of these gigantic, post-tertiary animals. On their arrival in this country, these fossils were stored in a commission house in Philadelphia until a few weeks since, when they were sold at auction. The one secured for the Yale collection measures in the span of its antlers, thirteen feet, two inches. The others were of smaller size, and were sold, one to the Smithsonian Institute, one to the Philadelphia Academy of Natural Sciences, and the remaining one to Prof. Marsh.

In the open air, under ordinary pressure, sound travels at the rate of 1,090 feet per second, while in tubes 3½ feet in diameter, the rate is found to be 1,083 feet, and to decrease rapidly with the diameter.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

In Southern France the railways are seriously embarrassed every winter by snow drifts filling the deep cuttings, but the past season a section of the line of railway from Saint Etienne to Annoway, has been kept open by the judicious planting along the banks on either side of the track of pine trees a system of treatment previously adopted in arresting the *dunes*, or inroads of sea sands, which in many parts of France used to annually cause great damage.

A correspondent writes that the yield of the Catasauqua furnace, 240 tuns of iron in one week, has been surpassed by three furnaces in New York State. The "Fort Edward Furnace" has frequently made over 280 tuns per week, while one of the Messrs. Burden's Furnaces, during the month of March, 1867, averaged 269½ tuns per week, mostly of soft iron.

The hydrographic survey now going on in Maine, has already shown that the State has 1,955 sites of water power, with a working energy of 500,000 horse power, equal to a force of 4,000,000 men, and nearly twice that of the working energy, both by steam and water, of Great Britain and Ireland. This water power is scattered through every section of the State. Owing to the body of water in the 1,568 lakes, which form large reservoirs, and cover 2,441 square miles, the force of the streams flowing from them is more uniform throughout the year than elsewhere in the United States.

The Sierra Nevada mountains are crossed by the Central Pacific railroad, 100 miles from tide water, at an elevation of 7,042 feet. There are in the passage fifteen tunnels, and the blasting powder alone for the rock excavations, has cost $1,000,000 in gold.

A company has just been organized in Chicago for the purpose of constructing two blast furnaces near that city, with a capacity of fifty tuns per day. The iron ore of the Lake Superior region will be smelted with the coal recently discovered in Central Illinois, which has been tested and found to be well adapted to the purpose of iron working.

Utah Territory is known to abound in many of the useful, and it is believed also, precious metals. Coal of fair quality and a considerable quantity, has been found in various parts of the territory, and iron has for years past been mined in the Southern counties. On the western slope of the Wasatch mountains, about twenty-eight miles from Salt Lake City, is a canyon known as "Little Cottonwood." Valuable ores of iron, principally magnetic and hematite, abound in this canyon, but as yet no attempts have been made to work them into mines. There are also found argentiferous galena, fahlerz copper, silver gland, and other ores of silver. One ledge of argentiferous galena, called the "North Star," has been prospected by a tunnel 60 feet in length, from which about 400 tuns have been taken out. The vein is about ten feet thick, and carries galena which assays $100 per tun. The ore produced in this and neighboring ledges may be readily reduced by smelting, and requires no preparatory roasting.

The new railroad from Logansport to Union City, Ind., ninety-two miles in length, has, it is said, only four curves on the entire line. It forms the connecting link in a new and through route from Chicago to the Atlantic cities

It appears that at the close of 1867, four miles and 5,035 feet of the Mount Cenis tunnel had been completed, leaving two miles and 4,018 feet still to be pierced. The distance pierced in 1867 was 5,040 feet, as compared with 3,416 feet in 1866, 4,079 feet in 1865, and 1,144 feet in 1860. The outlay, during ten years, upon the work, amounted at the close of 1867 to about $8,000,000. The year 1871, it is expected, will witness the completion of the tunnel. Its total length when finished will be seven miles, 3,773 feet, and its total cost is estimated to reach the sum of $12,000,000, or something more than $1,500,000 per mile.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Process for Removing Impurities from Malt Liquors.—George Storey, Wheeling, West Va.—This invention relates to a new process for removing the impure and decomposing properties of malt liquors, by means of freezing.

Hay Raker and Loader.—Orrin Luce, Virgil, N. Y.—In this invention an improved adjustable device is employed for clearing the teeth, and conveying the hay to the elevator, and in connection with it other novel devices are employed for raising and lowering the teeth and the clearing apparatus.

Limb and Basket Holder.—Wm. Richardson, Baltimore, Md.—This device is a cheap and convenient instrument by which the fruit-gatherer can draw a distant limb near to him, and confine it in that position till he has secured its fruit. When not thus in use it can be employed to hold the fruit basket.

Machine for Tonguing, Grooving, etc.—Alexander McCreight, Tranquility, Ohio.—The present invention relates to a machine, the construction and arrangement of which is such that wood, properly fed into the same can be tongued or grooved, for producing either plain or fancy, or figured moldings, for use upon wood work of all kinds, or for forming panels or door frames, finishing sash frames, and, in general, for all purposes of ornamenting or relieving the surface of wood.

Artificial Leg.—Albert Strasser, Montgomery, Ala.—The present invention relates to artificial legs, when the leg is amputated at or above the knee.

Lamp Chimney.—William Onions, and Henry Roberts, St. Louis, Mo.—This invention relates to a new and improved lamp chimney, of that class which are composed of glass and metal—a glass lower portion, and a metal upper portion. The invention consists in a new and improved means for securing the metal to the glass portion of the chimney, whereby the latter is prevented from breaking under the expansion of the former, a contingency of frequent occurrence with chimneys of this class.

Shuttle.—Ezra P. Marble, Sutton, Mass.—This invention relates to a new and improved application of a spring to the spindle of a shuttle, whereby the spring is fully concealed, and entirely out of the way, so that when the shuttle is in use the spring cannot catch and cut or break the threads either of the warp or filling.

Carriage Wheel.—Levi Adams, Amherst, Mass.—This invention relates to a new and useful improvement in the construction of carriage wheels, whereby a wheel much stronger than usual is obtained, and one which will effectually preclude the locking of vehicles together, when coming in contact in passing each other.

Draft Regulator.—Jos. W. Branham, Franklin, Ind.—This invention relates to a new and improved method of constructing dampers or draft regulators for furnaces, whereby the draft is more nicely regulated, and whereby they are more fire proof.

Lever Purchase.—J. B. Case, Fletcher, Vt.—This invention relates to a new and improved method of constructing a support for the fulcrum of levers, and of combining the lever therewith, whereby a motion of the arms of a lever is permitted in any direction.

Back and Abdominal Supporter.—Mrs. John Ford, Salem, Oregon.—The present invention relates to a supporter for the back and abdomen, and is more especially intended for use by women, both before and after confinement, as well also as a means of relief and cure for the falling of the womb, and other similar diseases with women.

Match Box.—J. Kirchfeld, and F. Heyl, Riegelsville, Pa.—This invention relates to a new and improved match box for the use of tobacco smokers, and designed to be carried in the pocket for the purpose of holding friction watches and a fuse. The box is also supplied with a cutter for chopping the ends of cigars preparatory to lighting them. The invention consists in a novel construction of a box, the peculiar application of certain parts to it, etc., whereby a very convenient article for the purpose specified is obtained.

Means for Increasing the Production of Honey with the Ordinary Beehives.—A. J. Smith, and H. C. Reed, Decorah, Iowa.—This invention relates to a new and improved means for preventing the frequent swarming of bees, and, consequently, securing an increased amount of surplus honey from them.

RAKING DEVICE FOR HARVESTER.—Antony Shebanck, Cleveland, Ohio.—This invention relates to a new and improved automatic raking device for harvesters, and it consists in a new and improved means employed for operating the rake, moving it forward and backward over a segment or quadrant shaped platform, so that it will have, during said movement, a rising and falling motion; falling when the rake arrives at the front edge of the platform, so that it may work low over the same, from front to rear, and sweep or rake the cut grain therefrom, and rise at the rear end of the platform, and pass over the same from the rear to the front, in an elevated position, so as not to interfere with the cut grain thereon.

PLOW.—Mathias Penning, Leavenworth City, Kansas.—This invention consists in forming the coher in one continuous piece with a landside and shear extension, which is bolted to the mold board, by which arrangement the plow is made to operate in a more easy and efficacious manner.

COMBINED REEL AND SPINNING WHEEL.—G. Bradway and N. Bradley, Maquoketa, Iowa.—This invention relates to a combination of a reel with an ordinary spinning wheel, by attaching reel heads to the spokes of the wheel and connecting worm-wheel gearing for making the cut of yarn.

LACING AND FASTENING BOOTS AND SHOES.—Wm. Banister and Albert H. Rowell, Mass.—The object of this invention is to enable the lace or string to be pulled tight throughout its length by one motion, and also an improved method of securing the lace.

MANUFACTURE OF SPOTTED AND CLOUDED YARN.—John W. Bentley, Woonsocket, R. I.—This invention relates to an improvement in the manufacture of clouded or spotted yarn.

GAS FIXTURE.—Emory McClintock, New Brunswick, N. J.—This invention relates to a new device whereby the ordinary gas cock is dispensed with in gas fixtures for illuminating purposes, as for instance gas brackets for rooms and for other positions where gas fixtures are arranged for illuminating purposes.

SAW SET.—James F. Broadhead, Rondout, N. Y.—This invention relates to a new and improved method of constructing machines for setting saws.

STEAM JET HEAD FOR CLEANING BOILER TUBES AND FLUES.—Joel M. Wheeler, Oxford, Conn.—This invention relates to a new and improved method of forming "heads" for producing steam jets for cleaning the tubes and flues of steam boilers, where the same is made applicable to all horizontal tubular or flue boilers.

MACHINE FOR CLEANING BURRS FROM HAIR.—F. Walpert, Baltimore, Md.—This invention relates to an improved machine for cleaning burrs from the hair of the tails of horses and other animals.

DEVICE FOR SETTING WHEELS ON AXLES.—M. S. Wilcox, Union Mills, Ind.—This invention relates to a new and useful device for determining the exact length and also the pitch or set of axles for wagons and other vehicles.

OPERATING ROCK DRILLS AND STEAM CUT-OFF.—James H. Thomas, Lacon, Ill.—This invention relates to a new and improved method of operating rock drills, and to the manner in which the steam engine ports are opened and closed.

ROCKING CHAIRS AND CRADLES.—S. E. Martin, Shamokin, Pa.—This invention relates to an improvement in rocking chairs and cradles, rocking horses, and like contrivances, and consists in the application of a sole of gutta percha, india rubber, or other elastic gum, or of soft leather, to the rockers, rendering the rocking more easy and noiseless, preserving the carpets from wear and tear, and being also more economical in use than the rockers now adopted.

RAILROAD CHAIR.—Arcule Elms, North Granville, N. Y.—This invention relates to the manner of fastening the two parts of a railroad chair together in a simple and effective manner by a book lock device.

UMBRELLA RUNNER.—Wm. Lang, Brooklyn, E. D., N. Y.—The object of this invention is to provide a runner for umbrella rods, which shall be simple, elegant, and more convenient to operate than those heretofore made. It consists in providing a spring lever which operates crosswise of the runner, together with other devices conducing to the perfect operation of the runner.

END GATE FOR WAGON.—Enos S. Miller, Baltimore, Ohio.—The object of this invention is to provide an end gate for a wagon box which shall serve both as an end gate and a feed trough, as occasion may demand.

BREAST PAD.—Daniel K. Wertman, Centralia, Pa.—This invention relates to breast collars for harnesses and consists of tin pads stiffened by sheet metal plates and attached to the breast strap, whereby a breast strap or collar is obtained which is superior in many points to the breast collars heretofore made.

GATES.—Elias Roth, New Oxford, Pa.—This invention has for its object to furnish an improvement in the means for opening, closing and fastening gates, so that they may be opened and closed without its being necessary for the driver to get out of the carriage, or from any desired distance from the gate.

BOOKBINDER'S ROLL.—John Feely, New York city,—This invention relates to a new manner of securing the type to a roller and handle, for the purpose of producing an ornamenting or gilding bookbinder's roll, in which the type can be easily removed and replaced whenever desired.

BABY JUMPER.—John H. Coldwell, Poughkeepsie, N. Y.—This invention relates to a new baby jumper, in which arms projecting from the straight seat-bar are pivoted to arms projecting from the base, the arms on the seat-bar being adjustable, so that the fulcrum can be brought nearer to or further from the seat, and so that thereby the apparatus can be adapted for more or less heavy children.

MILK STIRRER.—Joel H. Soule, Georgetown, N. Y.—This invention has for its object to furnish an improved, self-acting machine, by means of which milk may be stirred in cheese factories and elsewhere, to keep the cream from rising during the night, or while said milk is standing.

WAGON JACK.—T. L. Gable, Orange, N. Y.—This invention has for its object to improve the construction of the improved wagon jack, patented by the same inventor April, 30, 1867, and numbered 64,302, so as to make it more convenient and effective in operation.

HAY COCKING AND TEDDING MACHINE.—R. T. Dill, Poughkeepsie, N. Y.—This invention has for its object to furnish an improved machine, by which hay may be cocked or tedded rapidly, conveniently, and thoroughly.

MACHINE FOR BENDING CARRIAGE CIRCLES.—S. S. Daniels, Kendallville, Ind.—This invention has for its object to furnish a simple, convenient, and effective machine for bending carriage circles.

WELTING OR CORDING ATTACHMENT FOR SEWING MACHINES.—Francis B. Contessa, New York city.—This invention consists in attaching to the ordinary foot-pad bar a curved roller, and in adjusting thereon an elastic ring, whereby the machine is adapted to the process of cording and welting generally, and especially to stitching or sewing on the lace or braid shoulder straps and chevrons in military work, thereby saving much valuable time.

CHAIR SEATS.—Henry Meyer, Grafton, Wis.—This invention relates to a machine for hollowing the upper surface of wooden chair seats, and consists in the combination of a carriage sliding on prepared rails, with a set screw, by means of which the depth of the depression will be regulated, and with revolving cutters, which can be easily removed from the head to be replaced by others of different shape when desired.

HEAT RADIATING ATTACHMENT FOR STOVES.—James H. Patterson, Glens Falls, N. Y., and Henry B. Northop, Sandy Hill, N. Y.—This invention relates to a new and improved heat-radiating attachment for Franklin and open stoves, and is a modification of a heat-radiating drum attachment, for which letters patent were granted to these inventors bearing date Jan. 30th, 1866.

DINNER KETTLE.—John Wagner, Cumberland, Md.—This invention relates to a new and improved dinner kettle, and consists in a peculiar construction of the same, whereby a greater number of compartments are obtained than usual, and the different kinds of food kept separate from each other.

CLAMP FOR HOLDING PALM LEAF WARP.—Cyrus Powers, Greenwich Village, Mass.—This invention relates to an improvement in a clamp for holding palm leaf warp to be attached to the apron of the cloth beam of a loom for weaving palm leaf web for hoods or other purposes.

STEEL AND IRON PLATES.—E. T. Ligon, Demopolis, Ala.—This invention relates to the covering of steel with copper, and consists, first, in serrating or otherwise roughening the surface of the steel to be covered, and, second, in then placing the said serrated steel plate, with the copper plate, in contact with such surface, with borax or tinner's flux between the two plates, after which the two plates are placed upon a thick bed-plate of cast iron or steel, previously heated to or above the melting point of copper, which bed plate is placed on the lower disk of the press, the upper disk of which is made hollow, and with a non-conducting substance inside.

DITCHING MACHINE.—W. A. Nichols, West Liberty, Iowa.—This invention relates to an improvement in a machine for cutting small ditches.

MILK SHELF.—William Veber, Jr., Shingle Creek, N. Y.—This invention relates to a method of constructing shelves for setting milk so as to allow the cream to rise for making butter.

SEWING MACHINE GAGE.—Charles H. Buck, 2d, West Arlington, Vt.—This invention relates to a new adjustable gage for sewing machines, which is not only a guide for the fabric to be sewed but which may also be provided with an adjustable binder for guiding and holding bands of suitable widths around edges of cloth or fabric of suitable thickness.

STEAM PLOW.—John C. Delavigne, New Orleans, La.—This invention relates to a method of plowing and cultivating land by steam power.

HOSE FOR CONDUCTING WATER.—Andrew Carney, New York city.—This invention relates to a method of constructing hose for conducting water forced through the same, whereby said hose is rendered more strong and durable and a freer passage is given to water through the same.

PIANO STOOL.—James Bramble and H. M. Deihl, Fort Wayne, Ind.—This invention consists in the application of the principle of hydrostatics for elevating or lowering the seat of a piano stool, whereby the performer may be raised or lowered on the seat without rising from it by the movement of the foot.

SEWING MACHINE.—A. W. Halbert, Taylor, N. Y.—This invention relates to improvements in the construction of sewing machines, and consists in the construction and arrangement of mechanism whereby the working parts are much simplified and movement is given to them all by one wheel directly connected with the needle bar, the shuttle and the feed plate.

CATTLE CAR.—Eugene Fontaine, Fort Wayne, Ind.—This invention relates to an improvement in cattle cars, whereby the same may be adapted for carrying either large or small animals.

COMPOSITION FOR WELDING AND REFINING CAST STEEL AND IRON.—Julius Lehmann, Bloomington, Ill.—This invention relates to a new composition for welding and refining cast steel and iron and for restoring burnt steel.

LOCK.—P. S. Felter, Cincinnatus, N. Y.—The object of this invention is to obtain a lock of simple and comparatively inexpensive construction which will be equally as secure against the efforts of burglars in picking the same as the various expensive burglar-proof locks now made, and one which, when locked from the inner side of the door and the key left in the lock, will not admit of being unlocked from the outer side of the door.

SHAFT BEARING.—Samuel Kine, McVeytown, Pa.—This invention is designed more particularly for the upper bearing of mill stone spindles or shafts but is equally applicable as friction roller bearings for other shafting. It consists of a box inclosing the spindle and which contains friction rollers working in the ends of levers which latter are adjustable by set screws to bring the rollers and spindle in a vertical position. The box serves to contain the lubricating material and is provided with a stuffing box to prevent the oil from running down the shaft.

PLOWS AND OTHER FENCE TOOLS FOR JOINERS' USE.—E. M. Chapin and Solon Rust, Pine Meadow, Conn.—The object of this invention is to construct a joiners' plow and other similar tools which are provided with adjustable fences, in such a manner that the fence guides and screws will not extend through the body or stock of the implement, as is now the case, and which is the source of a great deal of annoyance in using such tools, rendering it necessary for the workman, each time the tool is used, to remove out of the way or to one side tools and implements of various kinds on the work bench which may chance to be at the right-hand side of the tool and near the same.

SAFETY GUARD FOR FIRE-ARMS.—Benjamin P. Cutler, Boston, Mass.—This invention relates to a device for the purpose of rendering fire arms safe from accidental discharge. It consists of a guard rod which is presented at the side of and beyond the cone or nipple to receive the contact of the hammer until the moment of firing arrives when it is then readily withdrawn.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

J. H., of N. Y., has had the case of his gold watch stained with mercury and asks how to remove the stains. Mercury combines readily with gold and can be effectually removed only by heating. Heat volatilizes the mercury, which leaves in the form of vapor. A careful hand may, by the use of a blow pipe or even a common spirit lamp, remove the stains without injury to the works or case, which may, however, require after polishing.

S. G., of Pa.—"What is the rate of increase of pressure of confined atmospheric air at high temperatures?" The pressure of confined air is increased at the rate of fifteen pounds for each addition of about 500° of sensible temperature. You will find this matter and your cognate questions discussed in "Cook's Chemical Physics."

E. F., of R. I.—"In the common pump is the whole column of water raised at every stroke by the muscular force of the operator?" Yes.

J. H., of Mass.—"The equivalent of acetic acid (dry) is 51· of of oxide of lead 111·7. I should suppose by this that each part of (dry) acid would dissolve 2 parts of oxide of lead. I have only been able to make one part of dry acid dissolve only a little more than one part of oxide of lead without the formation of a basic salt; how can this be prevented?" There should be no difficulty in dissolving 111·5 parts of oxide of lead (by weight) in 51 of acetic acid and obtaining a neutral salt. Have you perhaps tried to dissolve 2 equivalents instead of 2 parts by weight? "After ammonia has been extracted from the ammoniacal liquor of the gas works, can the residue be profitably employed to manufacture cyanides or carbolic acid?" We believe not.

C. G., of Ohio.—"What is the extreme radius of a 52-sided polygon, the sides of which are twelve feet each?" We do not know whether by the "extreme radius" you mean the longest diagonal or the radius of the circumscribed circle. At your request we will give you a simple method of determining such questions yourself without much knowledge of mathematics. Draw a circle and two diameters of it at right angles to each other. Divide every quadrant of the circle into the requisite number of equal parts, in this case 4 into 13 arcs, each about 7° in length. By connecting the ends of each arc by straight lines you will construct the polygon. Now draw the line required, and by means of a graduated ruler, compare its length with any of the sides of the polygon. If, for example, in our case the "extreme radius" is N times larger than one side of the polygon, its actual length will be N x 12 feet.

J. H. T., of Racine College.—"Will you inform me of the process of preserving bird's skin, both for laying away and also for setting them up in cases?" Bird's skins are preserved by rubbing them with a solution of arsenic or corrosive sublimate. The first, after a time, evolves arseniated hydrogen, which is highly poisonous.

G. C., of N. Y.—"Can you inform me why a continuous sound issuing from a rapidly moving body (take for example the whistle of a locomotive) is a higher note when approaching than when directly opposite, or past the point where one is standing? The sound slurs as it passes, from the note at which you first hear it, to one several semitones below. The same phenomenon may be observed during the passage of a shot or shell." We have never observed this phenomenon and are inclined to class it among the "auricular" delusions. Perhaps, also, our correspondent confounds the intensity with the pitch of the sound; the former varies with the distance, while the latter remains the same.

J. B. D., of N. Y.—Stone breaking machinery was made by a Mr. Blake, of New Haven, Conn, several years ago, and perhaps is still made by him. We have had a great many inquiries for this class of machinery, and parties who can furnish it would find a demand by advertising.

G. W. N., of Pa.—"What is the difference between the stroke and the throw of a cam? Some contend that the stroke is the hight it raises a lever, and the throw the point at which the steam is cut off." The "throw" of a cam is the distance it moves the lever. If the lever is hung and vibrates on its center, the movement of the valve corresponds with it and is the throw.

Business and Personal.

The charge for insertion under this head is one dollar a line.

There are now in actual operation eight thousand of Ashcroft's Low-Water Detectors. John Ashcroft, 50 John st., New York.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Parties wishing to Manufacture the Hoiler Knitting Machine on royalty, or who would manufacture machines for a Company, address Todd & Duncan, Bellefonte, Pa.

Henry Carey Baird, Industrial Publisher, 406 Walnut st., Philadelphia, has just issued a new and much enlarged descriptive Catalogue of Practical and Scientific Books, 56 pages, 8vo, now the largest list of this character, comprising only the Publications of any one house in either the United States or Great Britain. It will be sent free of postage to any one who will favor him with his address. Every reader of the Scientific American is invited to send for it.

Coal-oil Works, revolving retorts and refinery, lately erected, for sale. Address, on the premises, John White, Darlington, Beaver Co., Pa., or C. G. Waterbury, 116 Wall st., New York.

$2,500 will buy one-half interest in a business that will pay fifteen thousand dollars a year. Address Steam Mill, Belair, Ga.

Bartlett's Reversible Sewing Machines are the cheapest reliable Machines. Bartlett Machine and Needle Depot 569 Broadway, N. Y

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

For Patent Engine Lathes and Upright Drills, Planer Centers, Lathe Chucks, Planer Chucks, and all kinds of Cutlery Machinery address Thomas Iron Works, Worcester, Mass.

Incrustations of Boilers removed and prevented by Winans' Boiler Powder. (11 Wall st., N. Y.), 12 years in use, no injury, no foaming.

To insure the safety of your steam boilers, property, and life, apply Ashcroft's Low-water detector. John Ashcroft, 50 John st., N. Y.

For Improved Lathe Dogs and Machinists' Clamps, address for Circular, C. W. Le Count, South Norwalk, Conn.

Brick Machine.—Lafler's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Lafler & Co., Albion, Orleans county, N. Y.

For Cotton and Woolen Machinery—Roll-carding Machines, Ring and Traveller Spinning Frames, etc., address Union Iron Works, Rainebeck, N. Y.

Seal-Press Manufacturers will find the most valuable invention of the age, in their line of business, advertised on another page.

Malleable Iron Manufacturers, for small articles, please send address to N. W. Robinson, Moriah, Essex Co., N. Y.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, Pa., has just published "Perpetual Motion;" or, A Search for Self-Motive Power During the 17th, 18th, and 19th Centuries. By Henry Dircks, C. E., with numerous Illustrations. 358 pages. Price $3 50 by mail free of postage.

Parties wishing to contract for first-class Brass and Composition Castings, please address Ridlon & Bond, P.O. Box 733, Biddeford, Me.

Projecters of Wooden Railroads address G. S. Nevius, Bushnell, Ill.

Manufacturers of Wrought Butts and Flap and Strap Hinges address X. Y. Z., Lock Box No. 216 Providence, R. I.

Wanted—A Situation in a Planing Mill, as Foreman, or to take charge of Machinery and Saws. Address W. F. Gordon, Ann Arbor, Mich. Good reference given if required.

A No. 5 P. H. & F. M. Root's Blower for a large foundery, but little used, for sale by Hale, Murdock & Peters Columbus, Miss.

Allen's Catalogue of Agricultural and Household Implements and Machinery, Seeds and Fertilizers.—Messrs. R. H. Allen & Co. 189 and 191 Water street, New York (P. O. Box 376), have just issued a new edition of their very complete and handsome Catalogue for the current and coming season. It fills 272 pages, is illustrated with nearly 200 engravings, and is sent to applicants for $1—less than the actual cost of production.

NEW PUBLICATIONS.

POEMS. By Mrs. O. M. Livingston. New York: Hurd & Houghton.

A volume of poetry, homely, unpretentious, and fresh; the subjects, mostly drawn from New England home scenes, treated without any attempt at "fine writing," and charming for their naturalness and simplicity. The text is clear and elegant, justifying the well-earned reputation of the publishers.

THE WATCH. How to Choose It and How to Use It. By H. F. Piaget, 119 Fulton street, N. Y.

This is a very small work, comprising less than 100 pages, but the author is a practical watchmaker, and the hints he gives to purchasers and owners of watches are very useful. He gives a brief description of the difference in the construction of watches made by the various celebrated manufacturers in Europe and in our own country, which is of importance to the uninitiated purchaser.

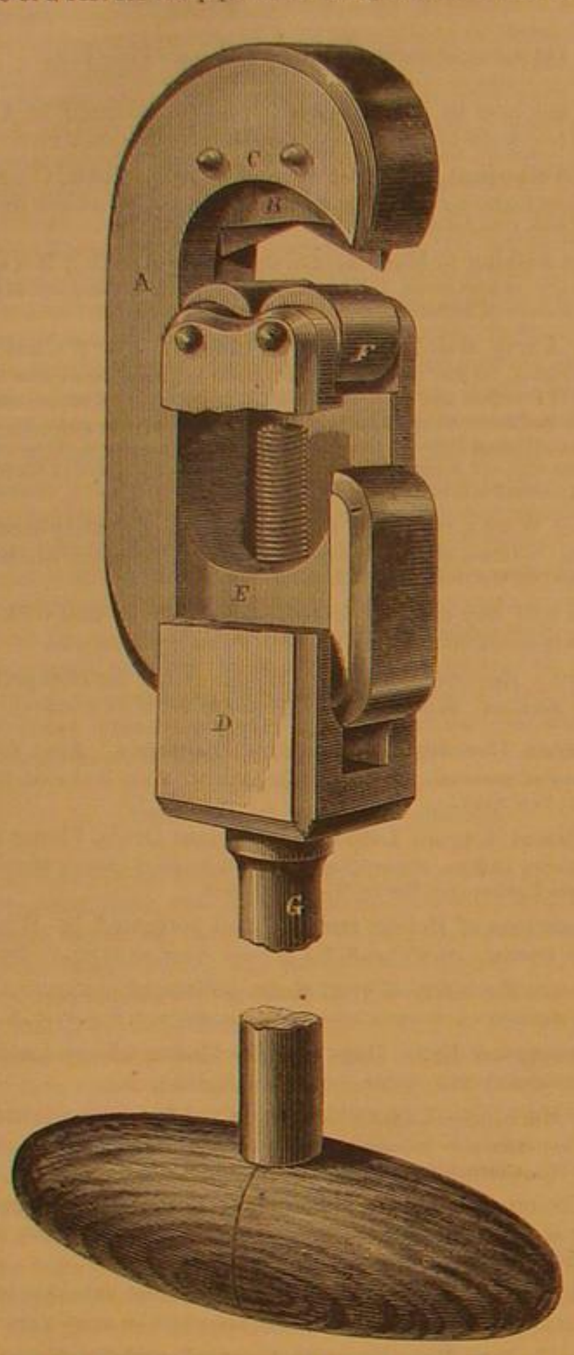
KNOX COUNTY, ILL., DIRECTORY.

J. L. Dewey, Galesburg, Ill., has undertaken the publication of Directories for the different counties in Illinois. The first of the series (Knox county) is just out, and will be found of interest to every resident of that county.

GETTY'S PATENT PIPE CUTTER.

Hand pipe cutters have not been always successful ventures. Most of them have some radical defect, in some the cutter frequently breaking, while in others the head block forms a bearing for the pipe, creating great friction, making the labor of cutting excessive, and wearing the head block rapidly away. Others have no proper method of securing the carrier or slide, which sometimes gets lost, and the tool is useless. In those which depend on some kind of scraper to take off the burr edge left by the action of the knife, the friction and labor are also great. The inventor of the cutter shown in the engraving believes these objections are removed in this implement.

The head block, A, is forged of wrought iron, and is slotted for the reception of the knife, B, which is V-shaped, and thus makes a drawing cut, no matter how it is turned, and while making a splendid cutting tool, it also serves the double purpose of a rest for the pipe while being cut and a protection to



the head block. The pins, C, which are tapering, pass through the head block and knife, and thus, though holding the latter perfectly firm, allow it to be easily removed. The slide, D, is of malleable iron, and travels in a broad groove, E, formed on the sides of the head block. It carries the two steel anti-friction and pressing rollers, F, which allow the cutter to work smoothly and easily, and also rolls down the burr edge thrown up by action of the knife, and presses the pipe to be cut up against the knife. The handle, G, has a boss formed on it for the purpose of pushing the slide, which carries the anti-friction rollers, forward. One end of it is screwed, and works in a thread formed in the head block. The other end has a wooden handle for the purpose of working the implement.

The advantages of this cutter are as follows: The knives are simple, durable, easily replaced, and they are interchangeable; the rollers roll down the burr edge, and make the cutter work easily; the slide is always held perfectly steady, no matter how small the pipe being cut, by means of the grooves in the head block, and also by the handle rod; the head block and slide cannot wear out, as the former is protected by the knife and the latter by the rollers. There are two sizes; one cuts from one inch down, the other from two inches to three quarters of an inch.

Patented through the Scientific American Patent Agency, Aug. 6, 1867, by Henry Getty, of Brooklyn, N. Y., and they are manufactured by McNab & Harlan, 86 John street, New York city.

Curiosities of Sound.

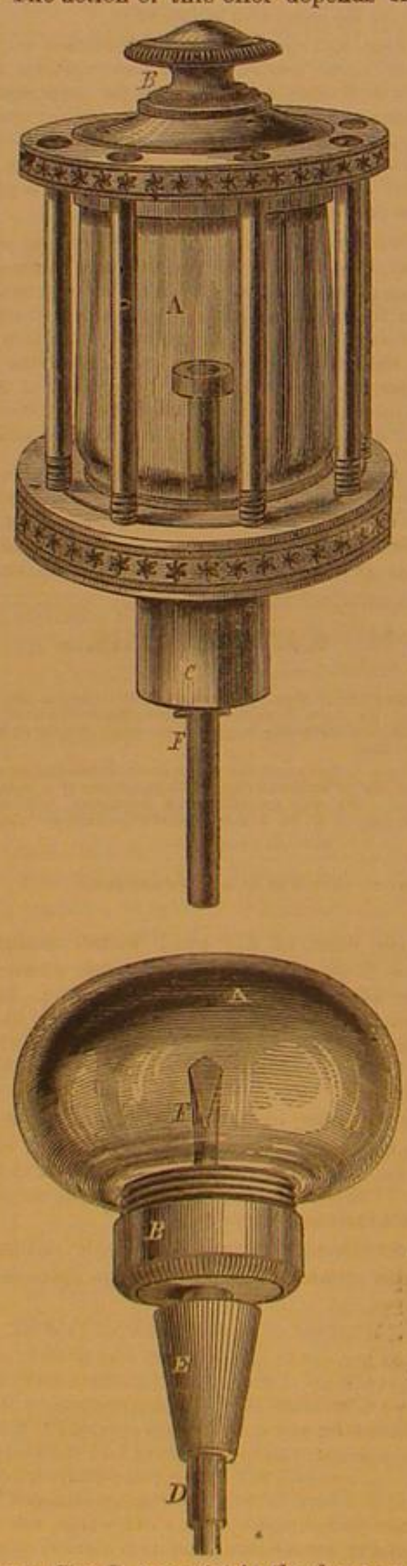
Among the things not generally known, Dr. Tyndall informs us that sound resembles light, in being susceptible of refraction. The refraction of a luminous beam by a lens is a consequence of the retardation suffered by the light in passing through the glass. Sound may be similarly refracted by causing it to pass through a lens which retards its motion. Such a lens is formed when we fill a thin balloon with some gas heavier than air. As an example, the professor takes a collodion balloon filled with carbonic acid gas, the envelope being so thin as to yield readily to the pulses which strike against it, transmitting them to the gas inside. He then hangs up his watch close to the lens, and then, at a distance, of four or five feet on the other side of the lens, he listens, assisting his ear with a glass funnel, which acts as an ear trumpet. By moving his head about he soon discovers a position in which the ticking of the watch is particularly loud. This, in fact, is the focus of the lens. If he moves his ear away from this focus, the intensity of the sound decreases. If, when his ear is at the focus, the balloon be removed, the ticks are enfeebled; on replacing the balloon their force is restored. The lens enables him to hear the ticks distinctly when they are perfectly inaudible to the unaided ear. The sound lens magnifies small sounds, as the glass lens magnifies minute objects. Thin india-rubber ballons form excellent sound lens.

The moderate speed of sound in air is the cause of a number of curious facts which ignorant people might take for contradictions. For instance, if a row of soldiers form a circle and discharge their pieces all at the same time, the sound will be heard as a single discharge by a person occupying the center of the circle. But if the men form a straight row, and if the observer stand at one end of the row, the simultaneous discharge of the men's pieces will be prolonged to a kind of roar. A company of soldiers marching to music along a road, cannot march to time together, for the notes do not reach those in front and those behind simultaneously.

The velocity of sound in water is more than four times its velocity in air. The velocity of sound in iron is seventeen times its velocity in air. The difference of velocity in iron and in air may be illustrated by the following instructive experiment: Choose a long bar of iron, and let an assistant strike the bar at one end, while the ear of the observer is held close to the bar at a considerable distance. Two sounds will reach the ear in succession; the first being transmitted through the iron, and the second through the air. This effect was observed by M. Biot, in his experiments on the iron water pipes of Paris.

IMPROVED OILER FOR SHAFT JOURNALS, CRANK PINS, ETC.

The action of this oiler depends entirely on the motion of the journal to which it is attached, it giving out no oil when the shaft is still, but adapting the amount delivered to the velocity of the surface of the journal. It is made in different forms for adaptation to different positions. The oil receptacle, A, is of glass, either incased in an ornamental frame of brass, or supported by a brass cap and stem. The caps, B, are for filling the oil cups, and when screwed in, or on, are air tight. The stem, C, may be plain or threaded, as desired, for securing the cup to the cap of the box, or the strap of a connection, crank, etc. The stem or pipe, D, receives on its exterior a wooden cone, E, for the same purpose of attaching it to the box. Through the hollow stems, C and D, passes a wire, F, which may be called a feeder, the lower end of the wire resting on the journal of the shaft and receiving a trembling or jarring motion from the rotation of the shaft. This motion allows a sufficient quantity of atmospheric air to pass up through the annular space between the pin or wire, F, and the interior of the stem, C or D, to assist in the downward movement of the oil, while the motion itself aids to the same result. Patented through the Scientific American Patent Agency, May 2, 1867, by I. R. Dreyfus, whom address, at 35 John st., New York, or P. O. box 5476.



Artificial Ivory.

I make use of the following ingredients, in about the proportions named, by weight: Shellac 8 parts, asbestos 7 parts, kaolin 2½ parts, camphor ½ part. To these I add the desired coloring matter. For light colors, sufficient white lead or similar pigment (about two ounces), to make the compound a white ivory color, and this may be tinted almost any desired hue, but for dark colors a less proportion of white may be employed, or it may be omitted.

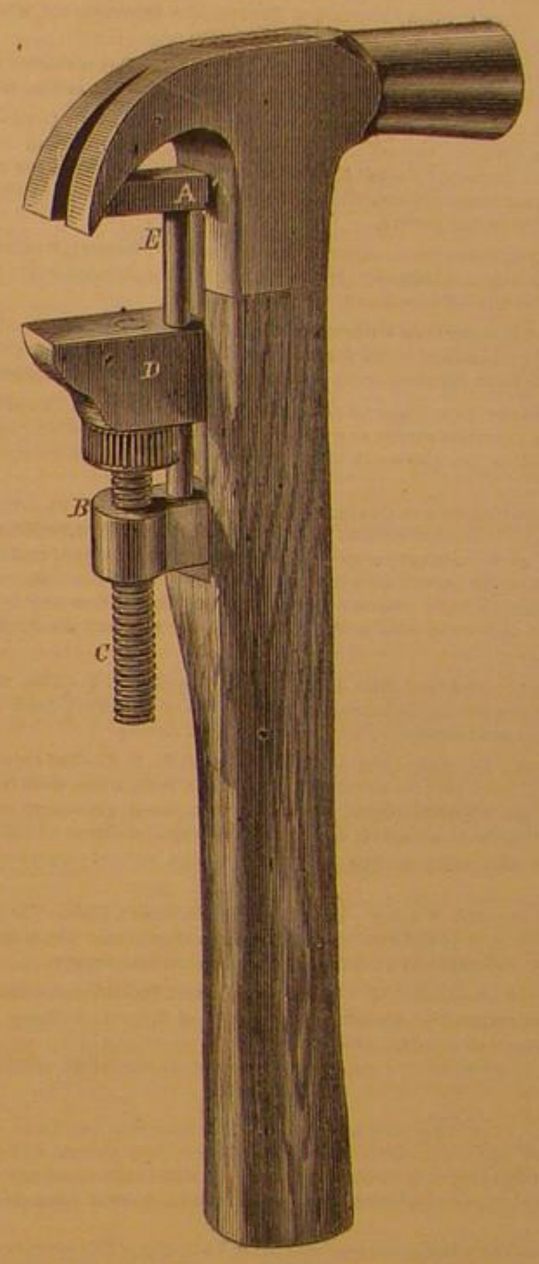
My compound is designed to imitate ivory, and is adapted to the manufacture of any article that can be formed by pressure while in a heated, plastic state; for instance, billiard balls, numbers, counters, checks, paper cutters, ornamental fancy articles, and, in dentistry, may be used for the filling of teeth, for artificial-gum work, and for plates, as the said composition may be colored of almost any hue.

The composition I employ is to be heated and mixed in the most thorough manner. For this purpose I mix my ingredients after they have been finely ground or pulverized, and I prefer to employ a pan heated by steam at a temperature of about 240° to 280° Fah., and then thoroughly mix or grind the substances together between heated rollers.

Recently patented by Alfred Starr, of New York city. We think it will be some time before dentists make use of this compound for filling teeth. It bears about as close a resemblance to ivory as chalk does to cheese.

MEEKER'S COMBINED CLAW HAMMER AND SCREW WRENCH.

The engraving is a view of a combined tool, which is intended mainly for the use of farmers, teamsters, and others, who have not ready access to shops or a chest of tools, and is



adapted to the facilitation of repairs in exigencies. It is a simple and handy tool, notwithstanding its double office. It is really a common claw hammer, one of the claws of which has a connection reaching from the point of the claw to the shank of the hammer, and forming, as at A, the stationary jaw of the wrench. A plate is inserted into the handle, having at the handle end a projection, B, which is a nut for the screw, C, that moves the jaw, D, by means of a knurled knob as in ordinary screw wrenches, a rod, E, being the guide for the movable jaw. It will thus be seen that the screw wrench is complete in itself, and yet is an efficient claw hammer. If, however, the hammer alone should be needed, a screw, the head of which is on the side opposite the jaws, may be loosened, and the wrench plate with its appurtenances removed, leaving simply an ordinary hammer. For farmers, wagoners, and others, it will prove a valuable tool.

Patented through the Scientific American Patent Agency, Feb. 18, 1868, by Ellis R. Meeker, who manufactures largely at Elizabeth, N. J. This combination tool can be sold at a price very little in advance of the ordinary claw hammer. For further particulars address the patentee and manufacturer, as above.

An Invention Wanted.

A correspondent calls our attention to the importance of the peanut crop, which, he says, in Eastern Virginia and North Carolina, is being very much extended; the greatest difficulty attending the preparation of the crop for market is the picking from the vines, which is done by hand, a tedious and expensive operation. No machine having been yet introduced for that purpose, will you please call the attention of inventors, through the medium of your widely circulating journal, to the great need of such a machine.

While force of some kind must be employed to create or construct a reservoir of power, and that force is greater, reckoning friction, than the power ultimately yielded; yet if it can be exerted with a comparatively brief expenditure of time, it may be an economical means of creating power to be used gradually or at intervals.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN. S. H. WALES. A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York
☞ "The New York News Company," 8 Spruce street.
☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents for the SCIENTIFIC AMERICAN.
☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XVIII., No. 16....[NEW SERIES.]..*Twenty-third Year.*

NEW YORK, SATURDAY, APRIL 18, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Machine for Stretching and Winding Woolen Cloth.... 241
*Improved Hat Band Buckle for Holding Railroad Tickets..... 241
To Toughen and Refine Gold..... 241
Composition Oil..... 241
*Thomas' Patent Belt Coupling... 241
Editorial Correspondence..... 242
Animal Electricity..... 242
Packfong and White Metal..... 242
New Mode of Preserving Eggs.... 242
Steam Boilers—Their Construction and Use..... 243
Imitating Cluster Jewelry..... 243
Mechanical Decoy Bird..... 243
Curious Things About Frost..... 243
*Improvement in Holdback Hooks..... 244
Tar Pavement Cement..... 244
Improved Process of Purifying Iron and Steel..... 244
Easy and Cheap Modes of Enriching the Soil..... 244
Effect of Bright Red on Animals.. 244
Bridge Piers and Floating Ice..... 244
*How a Snow Flake is Built..... 245
Improvement in Hand Printing Presses..... 245
Improvement in the Manufacture of Molded Articles..... 245
Curious Habits of the Chlamyder. 245
Dissolving Aniline Colors..... 246
Editorial Summary..... 246
Manufacturing, Mining, and Railroad Items..... 246
Recent American and Foreign Patents..... 246
Answers to Correspondents..... 247
New Publications..... 247
*Getty's Patent Pipe Cutter..... 248
Curiosities of Sound..... 248
*Improved Oiler for Shaft Journals, Crank Pins, etc..... 248
Artificial Ivory..... 248
*Meeker's Combined Claw Hammer and Screw Wrench..... 248
An Invention Wanted..... 248
The Value of Skilled Labor..... 249
Shafting and Belts—Absorption and Transmission of Power... 249
Useless Speculations..... 249
Technical Education..... 249
Report of Life Saving Inventions. 249
Painting and Preserving Iron Work..... 250
Yankee Ingenuity—A Reliable Improvised Alarm..... 250
Hall's Combined Pocket Knife and Door Button..... 250
Amended Tax Bill..... 250
Patent Claims....250, 251, 252, 253, 254
Pending Applications for Reissues 254
Inventions Patented in England by Americans..... 254
Extension Notices..... 254

THE VALUE OF SKILLED LABOR.

It is unpleasant to read in our daily journals of the destitution among our laboring classes because of the lack of work. Yet it is the fact that thousands are actually suffering for want of employment, and still it is no less the fact that skilled labor is in as great demand now as ever. The thorough master of his business, unless that business is entirely prostrated, will never find himself, for any long time, unemployed, if he desires employment. If a workman at any business—mechanical or intellectual—is not a competent worker the place he desires will be sure to be filled by his superior, the master of his business. Men, like the particles of fluids, must find their level, and neither can rise above it without outside aid. The man in any business whose sole use and value is to fill a hole accidentally left open, does not amount to much. He only is valuable whose services are eagerly sought, and, being secured, are retained. When the employer seeks the worker it may be considered that the latter is worth the seeking; but there are thousands who might be sought, but who never would take the trouble to make themselves worth the seeking. These "slumps" of mechanics, making pretense to a name to which they have no right, are stumbling blocks in the way of really worthy men. We speak not of the apprentice and learner who have never had a sufficient opportunity to acquire a full knowledge of their business, but of those who, being either unfitted by taste or talent for their chosen business, look upon it solely as a means of earning their bread and butter and never imagined such a thing as enthusiasm or interest in their work. Such men, even in the best of times, are suffered and borne with, rather than valued in the shop. They may do the work set before them, but never care enough about its character when finished or their own reputation as workmen to take care and pains, use thought and brains, as well as muscle, in its prosecution. Being only automatons—breathing machines—their places are filled by work-*men* as soon as business becomes slack.

Yet it is not difficult for the worker to arrive at the head of his profession, whatever it may be, if first he has any aptitude and taste for it. All that is needed is application and an interest in his work. It may take years to accomplish the result, but the time will have been profitably spent. Once a workman, in the highest sense of the term, his future is secure. His efforts will be appreciated and his proper position assured on a very brief trial, even by a stranger.

These remarks apply equally well to those who live by their brain rather than their muscle; many a so-called editor is such simply by the circumstance that no proper man has found and occupied the position assumed by him who cannot properly fill it. And possibly there is no more bare-faced assumption of responsibilities and duties for which the pretender is totally unfitted than that of some would-be literary people; yet the mechanical branches of industry are thronged with such apologies for workmen; men who have no love for their work, no respect for themselves, and no regard for the interests of their employers. Such men should turn their attention to work requiring scarcely more brains than that of the ox.

The skilled workman is to be envied. He knows his own value, and feels thereby a pride in his business and a respect for himself. He is, in a measure, independent, for his services are needed and will always receive their full market value. It is better to be a thorough workman in the lowest branch of mechanical business than a mere hanger on in a popular or genteel occupation. Will our young men and mechanics consider this matter?

SHAFTING AND BELTS—ABSORPTION AND TRANSMISSION OF POWER.

The renting of power for driving machinery is in many parts of the country as common as the renting of habitations and places of business, but while the value of the yearly amount to be paid for the latter can be easily ascertained and fixed, from the known cost of the premises, this or other sufficient data are wanting in regard to the amount of power used. Where that power is ample and cheap, as in a constant and sufficient water privilege, the amount of rent paid may be of little consequence; but where all the power must be generated from fuel and transmitted by the steam engine, it becomes a matter of great consequence to the proprieter. Only the crudest means are at present available to ascertain the amount of power transmitted by pulleys and belts. So many conditions are to be considered that the construction of a set of rules for calculating the amount of power in all cases, is simply impossible. Not only the width of the belt, the diameter of the pulleys, and the relative position of the shafts, but the condition of the belts and the velocity of the shafts, must be taken into consideration, together with the peculiar circumstances which every separate case presents.

It is well known that the closest mathematical calculations, based on the style of engine, diameter of cylinder, length of stroke, velocity of piston, pressure of steam, and other points of a steam engine fail to give accurately the amount of power the machine may develope. The actual trial by means of the indicator in the hands of a skillful manipulator is the only reliable test. From one of the best—if not the best—masters of the indicator in this country, we learn that engines calculated by their builders to give a certain amount of power often so signally fail of achieving the result desired that in one recent instance an engine calculated for sixty-horse power had run for months yielding less than twenty-six-horse power! The indicator showed the fact, and the experience of the operator detected the fault and pointed out the remedy.

Now if in a machine constructed with such care and skill as the steam engine such a wide difference should be found between the calculated and indicated horse power, what difference should we not expect, when the test is applied to a case presenting so many points of possible variations between the intended and real amount of power as that of belt transmission? And it is the fact that in very many cases the proprietor of steam power, knowing the actual power of his engine, finds that letting for hire what he deems is one-half of that power, his tenants are absorbing nearly the whole available power. The rough method of calculating the amount of power delivered or transmitted, by the width of driven belt—a plan which was common enough a few years ago, and may be so now—is as ridiculous and as far from the truth as the formula of the astronomical instructor who taught his pupils in estimating the distance of the fixed stars from our planet to "guess at the distance and multiply by four;" or as accurate as the man who took the measure of a door opening in a house he was building by measuring it with his outstretched hands, and rushed to the door maker with his hands held in position. Scarcely less nonsensical and foolish is the plan of charging for power to drive a wood turning establishment, with its lathes revolving at the rate of thousands of revolutions per minute, at the same price per machine as the machine shop with its equal number of lathes and planers revolving at a very low rate of speed. Yet we have seen, very lately too, a case of this character, where the owner of an establishment actually rented power for a wood worker—sawyer and turner—at a lower price per machine than he charged a machinist, and then wondered how the power of his engine could be so absorbed. "Wood, he said was easily worked; it must require more power to drive a lathe turning iron than one turning wood." In this statement he plainly showed his want of knowledge of the simplest principles of mechanics. Velocity is a great absorbent of power, and where a shaft is run at a rapid rate the very friction of the shaft is a serious drawback to the amount of power it will transmit compared with the amount received. To get the best results from belts they should not be driven more than thirty feet per second or eighteen hundred feet per minute; yet they are often driven at a much higher rate. There is a limit to the effective cohesion of belts to pulley faces, a fact, we are sorry to notice, some of our best mechanics are slow to acknowledge, or, at least, to put in practice.

A belt running horizontally—not crossed—will without excessive tension, deliver more power than one of the same width and weight running vertically. This every mechanic knows. It will also run easier. So with belts in other positions and under varying circumstances. It is evident, therefore, that calculations of the power transmitted by belts, based exclusively on their width, will not be reliable under all circumstances.

From a letter before us we learn that by the trial of a dynamometer, already patented and now in process of repeated and extended trial, the results of its trial have surprised letters of power and disgusted the hirers and users. In a trial where it was tested by the most elaborate and exact experiments, in one case it was found that it showed a difference of one hundred and twenty-five per cent between the amount of power used and that actually paid for, in favor of the proprietor. "Few," he says, after many trials, "imagine the amount of power absorbed by rapidly-driven shafts." We hope his endeavors to construct a dynamometer, which may be applied under all circumstances, and give reliable results, may be successful. It is much needed.

USELESS SPECULATIONS.

There is a strange quality in the human mind, by virtue of which it ever seeks to divine the unfathomable and to unravel insoluble mysteries, neglecting often the more useful and practical inquiries of every day life in order to gratify its *penchant* for metaphysical subtleties. Every age has been haunted by some scientific phantom-problem, which it was beyond the power of human mind to solve, and the period of time in which we live forms no exception to this rule. While formerly the discovery of the "philosopher's stone," and other impossibilities, engaged the attention of actual and pretended philosophers, speculations concerning the origin of the world have of late years become the favorite theme of theorists. But there is one fact to which we will call attention. The labors of the alchymist laid the foundations of modern chemistry; the search for the square of the circle promoted mathematical science, and to the failure in securing perpetual motion we owe the spread of clearer notions on the subject of mechanical principles; but what, we ask, is the benefit that shall accrue to mankind from the vain attempt to lift the veil from the mysteries of the first creation? Even if any one of the thousand theories proposed would commend itself to general approval, it would only be a barren acquisition to our theoretical knowledge, from which not a single useful result could be expected, and which would prove to be valueless in the advancement of our race.

We make these remarks because an examination of the correspondence sent to this office discloses the fact that many of our readers waste their time and abilities on this unprofitable subject. We have also occasion to notice the entire disregard or ignorance of the most elementary and best established principles of science on the part of these theorists. Wild notions of heat, electricity, the properties of matter, and so forth, form the cement which holds together the hypotheses and speculations with which they construct the unsubstantial fabrics of their brains. They are not aware that our knowledge of the behavior of matter under the influence of extreme temperatures (heat or cold), is, as yet, far too imperfect to warrant attempts of generalization. The creation of matter, its formation and gradual settling into the present arrangement is a fit subject for the reveries of the poet or the unbridled speculations of the metaphysician; but practical men who are willing to improve themselves and others should leave it alone. There are too many urgent questions of real importance which claim and deserve all the attention and energy which they can bestow upon them. Those of our friends, however, for whom the temptation to "lift the veil" should prove too strong, will pardon us for suggesting that their first duty is to obtain a comprehensive knowledge of physics and chemistry. If, after obtaining this, they find that they are further from the solution of the puzzle than they thought themselves before, they will at least not have to repine for wasted time and labor, as they can render their newly acquired knowledge useful in a thousand different ways.

TECHNICAL EDUCATION.

In the matter of "technical education," which now forms a prominent topic of discussion on both sides of the Atlantic, there has been, hitherto, altogether too much talking and too little that looks toward a practical, satisfactory, and speedy solution of the question, and yet the discussions are becoming still more long-winded and unintelligible every day. If we are willing to look on and wait till the philosophers have ceased to wrangle on this subject and have come to an agreement among themselves, the day of judgment will certainly dawn on an earth unprovided with technical institutions. The necessity for something of this sort is, we think, all but universally recognized; the rest is of minor importance. If the institutions are once established the settlement of subordinate points will be best accomplished when they present themselves in practice. We therefore call upon those interested to move in this matter. A good beginning for the present would be the appointment of a teacher of natural sciences in every public school. There is plenty of time to spare for instruction of this kind there, and it would be a pleasant addition to the established scheme of studies. We have no doubt that the Board of Education and the various committees of trustees to whom the duty of watching over the interests of instruction is committed, would give their consent to this plan if they are approached in the right manner. This point gained, it would become a mere question of time to mature a more systematic and complete plan, which would fully meet our necessities. Workingmen, mechanics, artisans, laborers of every kind, recollect that your interests are chiefly at stake; for your sake the agitation was confessedly begun, and you should, therefore, lend a helping hand in the attainment of its objects. If your organizations bestir themselves vigorously there is no doubt, with a community constituted like ours, that you will soon be gratified by the fulfillment of your wishes.

REPORT ON LIFE-SAVING INVENTIONS.

The official report of Capt. W. M. Mew to the Secretary of the Treasury, detailing the results of the investigations of the government commission which met in New York city in April last, is before us. From it we learn that about three hundred and seventy inventions, designed for saving life at sea, were entered for examination, of which a number were not reported upon, they either not coming within the scope of the objects of the commission, or lacking in merit. A large number, however, were tested with great care and are recommended in the report for adoption and use. Capt. Mew says that in addition to the trials before the commission the inventions have been subjected to practical tests through

successive months of service, with a design to ascertain the correctness of the commission's first favorable report, and this has been the reason of the delay in its publication.

We believe the labors and report of the commission will exercise a very favorable influence on our inventors and mechanics. It is a step in the right direction, and it is to be hoped that this will not be the last of these official competitive examinations. Much credit is due Capt. Mew and the gentlemen associated with him for the very thorough manner in which their duties were performed. Over six weeks were spent in the examination of the inventions brought before them, and we believe that while the investigations were thorough and exhaustive no inventor had cause to complain of injustice or unfairness.

PAINTING AND PRESERVING IRON WORK.

A good black paint for coarse iron work may be made by mixing plumbago with hot coal tar. Equal parts of asphaltum and resin dissolved in common turpentine make also a good, cheap covering for heavy iron work. For machinery, dissolve 2 pounds india rubber, 4 pounds resin, and 2 pounds shellac, in 5 gallons of benzine. This may be used with any other paint as a vehicle. Wrought iron bridges are painted with white lead as follows: The iron work is first made clean by scrubbing and brushing it with wire brushes; this done, all the cavities and fissures are filled up with a putty of litharge, linseed oil, varnish, and white lead; this filling being dry, brushing is repeated. Afterward, a paint is applied, consisting of 300 pounds of white lead, 10 gallons crude, 1 or 2 gallons boiled linseed oil, and 1¼ gallons of turpentine. This paint is repeated when sufficiently dry, and finally evenly overspread with white sand. Galvanizing is employed also to prevent rusting. I have found a galvanizing paint in the trade, consisting chiefly of zinc powder and oil varnish. Rusting is further prevented by rubbing the red hot iron with wax, tallow, pitch, or coal tar. Rubbing with heavy petroleum is also well adapted for keeping iron work clean. The common varnish is obtained by adding at 280° some dried sulphate of zinc to boiled linseed oil—take one ounce for one gallon; a better kind is made by boiling 7 gallons of the former with 3 pounds of litharge and 2½ pounds of wax, until thick; when sufficiently cool and settled, the liquor is poured from the remainder.

Copal varnish is prepared by mixing 7 pounds of fused copal with ⅔ gallons of hot drying oil, thinning it off with 4 gallons of turpentine, and straining through a wire sieve of proper fineness. Amber varnish: Fuse 6 pounds of amber in an iron pot, and pour in 2½ gallons of hot clarified oil; boil it until it can be drawn out into a stringy mass, and mix with it 5½ gallons of turpentine. Black iron work varnish: Put 48 pounds of asphaltum in an iron kettle, and boil it for four hours. During the first two hours, introduce 7 pounds of red lead, 7 pounds of litharge, 3 pounds of sulphate of zinc, and 12 gallons of boiled oil. Continue the boiling for two hours, and when cool thin it off with 40 gallons of turpentine. Another recipe: Add gradually to 7 gallons of crude oil at a gentle heat, 10 pounds asphaltum in three gallons of hot oil; by stirring continually, add 7 pounds of litharge, 7 pounds of red lead, 3 of sulphate of zinc, and boil for three hours; let cool, and thin off with 40 gallons of turpentine, and strain finally through a fine sieve.

Yankee Ingenuity--A Reliable Improvised Alarm.

We believe our readers will be as much interested and amused as were we on the perusal of the following from a "Down East" (Bath, Me.) correspondent:

"I once stopped overnight at the house of a friend. It was desirable that we should take an early train next morning, and notwithstanding the assurance of the servant that we should be called bright and early, I felt anxious on retiring lest we should not rise in time; I therefore beset myself to devising an alarm. The only "base of preparation" was my watch. This I opened the face of, exposing the hands, and laid it, back down, on the toilet table. The hour-hand only was available to produce the action that should give the alarm, the minute-hand having many revolutions to make ere the appointed hour. A blade at each end of my pocket-knife was opened and the handle supported on three pennies (piled one on top of the other) so that it should be balanced, and at the same time have the blades on a line with the face, one blade resting lightly on the figure 4—the minute-hand passing over it in its revolutions. The object of this arrangement was to cause the hour-hand, on arriving at the hour of 4, to come in contact with the blade, and the knife being balanced, the hand would have sufficient power to move on its pivot (the pennies), the opposite end of the knife, of course, having a reverse motion.

I next drove a pin into the end of the handle of our hair-brush, and balanced it on the edge of the table, just so that it would topple over were not the end with the pin in it held down gently by the head of the pin coming under the blade at the end of the knife opposite the watch. I had previously tied one end of my handkerchief to the handle of the brush; the other end I now secured to the comb, with which I propped up the heavy lid of a fancy box that set on the table, leaving some "slack" between the brush and comb.

The machine was now "set," and the expected operation was this: The hour-hand should push the blade resting on the figure 4; the other blade would have a corresponding motion and slip off the head of the pin in the brush handle; this would allow the brush, balanced on the edge of the table, to tilt and fall, the slack in the handkerchief allowing it to acquire sufficient momentum in falling to pull out the comb supporting the heavy lid of the fancy box, which should fall "with a loud noise." These things really came to pass at the appointed hour, and we were roused from our slumber in time for the early train, and went on our way rejoicing."

Hall's Combined Pocket Knife and Door Button.

We would call the reader's attention to an engraving of a pocket knife illustrated of the back page of this paper. The invention consists in converting the ordinary pocket knife into a portable door button, always on hand and ever ready for an emergency, without additional cost or inconvenience.

The screw, as will be seen by the engraving, is hinged or pivoted in the back of the knife, and can be shut down the same as a blade. It is comparatively burglar proof, as it can be screwed fast to the jamb of a door at any point unknown to the burglar, and its use for a single night, where a person is in a room without a secure fastening to the door, would more than pay for its cost in sound sleep, especially if money or valuables were exposed. We have no doubt from its simplicity and utility, that it will become the favorite pocket knife with the trade. Merchants would do well to call and see it or send for a sample.

Dr. A. W. Hall, of 208 Broadway, New York, is the inventor and sole manufacturer.

AMENDED TAX BILL.

The annexed new Tax Bill has passed both Houses of Congress and received the President's signature. The law went into effect on the 1st of April, and will be a great relief to our extensive mechanical interests, while the penalties for fraudulent returns from whisky manufacturers are so stringent that it is believed the frauds heretofore perpetrated by unprincipled distillers will be effectually prevented.

Be it enacted, etc., That sections 94 and 95 of the act entitled "An act to provide Internal Revenue, to support the Government, to pay interest on the Public Debt, and for other purposes," approved June 13, 1861, and all acts and parts of acts amendatory of said sections, be and the same are hereby repealed, except only so much of the said sections and amendments thereto as relates to the taxes imposed thereby on gas made of coal, wholly or in part, or of any other material or illuminating, lubricating, or other mineral oils or articles the products of the distillation, redistillation, or refining of crude petroleum, or of any single distillation of coal, shale, peat, asphaltum, or other bituminous substances; on wines, therein described, and on snuff and all other manufactures of tobacco, including cigarettes, cigars, and cheroots, provided that the products of petroleum and bituminous substances hereinbefore mentioned, except illuminating gas, shall from and after the passage of this act, be taxed at one half the rates fixed by the said section 94.

Sec. 2. That nothing in this bill contained shall be construed to repeal of interfere with any law, regulation, or provision for the assessment or collection of any tax which under existing laws may accrue before the 1st day of April, A.D 1868; and nothing herein contained shall be construed as a repeal of any tax upon machinery or other articles which have been or may be delivered on contracts made with the United States prior to the passage of this act.

Sec. 3. That after the first day of June next no drawback of internal taxes paid on manufactures shall be allowed on the exportation of any article of domestic manufacture on which there is no internal tax at the time of exportation; nor shall such drawback be allowed in any case unless it shall be proved by sworn evidence in writing, to the satisfaction of the Commissioner of Internal Revenue, that the tax had been paid, and that such articles of manufacture were prior to the 1st day of April, 1868, actually purchased or actually manufactured and contracted for, to be delivered for such exportation; and no claim for such drawback, or for any drawback of internal tax on exportations made prior to the passage of this Act, shall be paid unless presented to the Commissioner of Internal Revenue before the 1st day of October, 1868.

Sec 4. That every person, firm, or corporation, who shall manufacture by hand or machinery, any goods, wares, or merchandise (breadstuffs and unmanufactured lumber excepted), not otherwise specially taxed as such, or who shall be engaged in the manufacture or preparation for sale of any article or compounds not otherwise specially taxed, or shall put up for sale in packages, with his own name or trade mark thereon, any articles or compounds not otherwise specially taxed, and whose annual sales exceed $5,000, shall pay, for every additional $1,000 in excess of $5,000, $2; and the amount of sales in excess of the rate of $5,000 per annum, shall be returned quarter-annually to the Assistant Assessor, and the tax on the excess of $5,000 shall be assessed by the Assessor, and paid quarter-yearly, in the months of January, April, July, and October of each year, as other taxes are assessed and paid; and the first assessment herein provided for shall be made in the month of July, 1868, for the three months then next preceding.

Sec. 5. That every person engaged in carrying on the business of a distiller who shall defraud, or attempt to defraud, the United States of the tax on the spirits distilled by him, or any part thereof, shall forfeit the distillery and distilling apparatuses used by him, and all distilled spirits, and all raw materials for the production of distilled spirits found in the distillery, and on the distillery premises; and shall, on conviction, be fined not less than $500 nor more than $5,000, and be imprisoned not less than six months nor more than three years.

Sec. 6. That if any officer or agent appointed and acting under the authority of any revenue law of the United States, shall be guilty of gross neglect in the discharge of any of the duties of his office, or shall conspire or collude with any other person to defraud the United States, or shall make opportunity for any persons to defraud the United States, or shall do, or omit to do any act with intent to enable any person to defraud the United States, or shall make or sign any false certificate or return in any case where he is by law or regulation required to make a certificate or return, or having knowledge or information of the violation of any revenue law, by any person, or of fraud committed by any person against the United States under any revenue law of the United States, shall fail to report in writing such knowledge or information to his next superior officer, and to the Commissioner of Internal Revenue, he shall, on conviction, be fined not less than $1,000 nor more than $5,000, and shall be imprisoned not less than six months nor more than three years.

Sec. 7, *And be it further enacted*, That no compromise, discontinuance, or *nolle prosequi*, of any prosecution under this act, shall be allowed, without the permission in writing of the Secretary of the Treasury and the Attorney General.

Vitrified Caoutchouc.—Photographers will be interested in the invention of M. Marion described in the columns of the *Moniteur de la Photographie*. The new product appears to occupy a position midway between glass and paper, less fragile than the one and less opaque than the other. The use to which this transparent film of india-rubber is destined by its inventor is to receive the film of collodion bearing the photographic image. A glass negative is obtained in the usual manner, and upon the sensitized side of the plate the caoutchouc film is applied by means of a special kind of varnish. When it has become dried, the whole is plunged into a vessel of water and in a few moments the collodion with its image leaves the glass, adhering to the new medium, which latter may be now packed away until it is required to be used to print from.

Improvement in Stem-winding Watches.—Messrs. O. P. Rice, Agent, and J. H. Gerry, Superintendent of the New York Watch Company, at Springfield, Mass., have invented a neat and effective device for winding and setting watches through the stem. It consists of an arbor running through the stem, and having a cam thereon, and a small loose segment riding in a correspondingly curved groove. The arbor being turned in the right direction, by the milled head upon its outer end, the watch is wound, and by slightly withdrawing the arbor, the winding gear is disengaged, when the watch may be set. The device is easily constructed, compact, and is free from the complication usually involved in stem winding devices.

Water-turned journals give a better surface for the action of a lubricant than emery-polished surfaces.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING MARCH 31, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,033.—Carriage Wheel.—Levi Adams, Amherst, Mass.

1 claim, 1st, The metallic, cone-shaped shield or deflector, C, applied or attached to the hub and spokes of the wheel concentric with the hub, substantially in the manner as and for the purpose set forth.

2d, The combination of the metallic hub, A, with the box, D, arranged substantially as shown and described.

76,034.—Hinge.—John Adt, Wolcottville, Conn., assignor by mense assignments to Wm. H. Hart and George S. Hurford.

I claim a hinge pin formed with a head at each end, previous to being introduced into the hinge, in the manner set forth.

76,035.—Tool for Shearing Bolts.—Abram Alexander (assignor to Alexander Bolt Manufacturing Co.), Pittsburg, Pa.

I claim, 1st, In tools for cutting round iron bars, the combination of the crank, D, pitman, E, lever, F, cogs H H, with the pieces, K K', dies, M and M', and suitable frame, A A' A' B, arranged substantially in the manner and operating as set forth.

2d, The sliding pieces, K and K, carrying sharp-edged steel dies, constructed as described, for indenting or grooving round iron rods for cutting the same, all arranged and operating substantially as specified.

3d, The dies, M and M', having sharp ridges, m m', and the projection, V, when used for grooving and breaking round iron, in the manner substantially as described.

76,036.—Harness Operating Mechanism for Loom.—John Bachelder and Wm. H. Bliss, 2d, Norwich, Conn., assignor to John Bachelder.

We claim, 1st, The vertical jack, c, and pivoted switch lever, k, both constructed and combined as shown, the switch lever being attached above the axis of the jacks, and arranged with the pattern device, as and for the purpose set forth.

2d, The compound jack lever, c k, constructed as described, in combination with the pattern device and with the mechanism substantially as shown, which actuates the pattern, all for the purpose set forth.

3d, The arrangement of the sleeve, d, jack levers, c, shaft, e, and eccentrics or cranks, f f, substantially in the manner and for the purpose described.

76,037.—Washing Machine.—Daniel W. Bancroft, Marshfield, Vt.

I claim, 1st, The swinging supports, h h, provided with spiral springs, m m, in combination with slots, g g, and shaft, E, substantially for the purpose specified.

2d, The adjustable cross beam, B, to which are hinged the beaters, d d, in combination with hinged arms, f f, shaft, E, swinging supports, h h, and spiral springs, m m, arranged substantially in the manner herein set forth.

76,038.—Mode of Lacing Boots and Shoes.—Wm. Banister and Albert H. Rowell (assignors to themselves and Isaac H. Butts), Lawrence, Mass.

We claim, 1st, The clasp for securing the lacings of boots and shoes, consisting of the plate, B, having the turned up lip, b, attached to its lower portion, the tongue, b', upon its upper edge, and the downward projecting lips, b', upon each side of said tongue, as herein shown and described.

2d, A loop lying flat upon the surface of the leather, and attached to a stud, or its equivalent, said loop being allowed to swing with the motion of the shoe-string, substantially as herein shown and described.

76,039.—Dumping Wagon.—Harvey Barton, Elyria, Ohio.

Antedated March 25, 1868.

I claim, 1st, The levers, N M, links, O, and slides, J, as arranged, in combination with the bottoms, H', in the manner as and for the purpose set forth.

2d, The bound, D, reach, G, and yoke, F, as arranged, in combination with the brackets, E, for the purpose and in the manner set forth.

76,040.—Horserake.—Henry L. Beach (assignor to Beach Horse Hay Rake Manufacturing Co.), New York city.

I claim, 1st, The combination of the teeth heads, E, and teeth, F, with the jointed bar, rod, or head, D, constructed and operating substantially as described.

2d, The sliding bar, M, in combination with the spring, N, and frame, when the same shall be constructed and operate substantially as described.

3d, In combination with the jointed bar, rod, or head, D, the connections, C, constructed and operating substantially as and for the purposes forth.

4th, Attaching the sliding bar, M, to the frame, so that the same may be moved away from the teeth heads, E, for the purposes set forth.

76,041.—Wire-truss Bridge.—Charles Bender, Hesse Darmstadt, Germany.

I claim, 1st, A bottom chord, consisting of an unbroken main cable and side cables, the latter consisting of as many pieces as there are panels, substantially as and for the purpose specified.

2d, The joints of the bottom chord, consisting of two side plates and a covering plate, as shown in figs. 1, 2, 3, 4, 5, the several parts being constructed and used as and for the purpose herein specified.

3d, The saddle joining the bottom and upper chords, in connection with bottom chords of truss bridges constructed of wire cables, substantially as set forth.

76,042.—Machine for Manufacturing Clouded Yarn.—John W. Bentley, Woonsocket, R. I.

I claim the combination of the additional rolls, H I L, and the change gear, G, with a common spinning frame, arranged and operating substantially as and for the purposes herein shown and described.

76,043.—Reel.—G. Bradway and N. Bradley, Maquoketa, Iowa.

We claim the combination and arrangement of stand, D, spindle, C, and wheel, o, having hooks, e, and worm, h, with wheel, E, pin, i, shaft, m, nut, p, and spring, n, as and for the purpose set forth.

76,044.—Piano Stool.—James Bramble and Hugh M. Deihl, Fort Wayne, Ind.

We claim controlling the hight of the seat of a piano stool by hydrostatic pressure, substantially as described.

76,045.—Draft Regulator.—Joseph W. Branham, Franklin, Ind.

I claim the draft regulator, constructed as described, consisting of the frame, A, having toe sheet, B, and the damper, C, to which the inner end of the notched lever, L, is pivoted, having its fulcrum upon the side of the frame, A, at a', said damper being held in any desired position by means of the pawl, d, engaging with the notches, h, of the lever, H, as herein described for the purpose specified.

76,046.—Saw Set.—James F. Brodhead, Rondout, N. Y.

I claim the wedge, D, in combination with the sliding bar, E, plate, C, handle, A B, and gage screw, L, all arranged as described for the purpose specified.

76,047.—Attachment for Sewing Machines.—Charles H. Buck, 2d, West Arlington, Vt.

I claim the binder, constructed as described, consisting of the plate, B, having a tapering shank, and fitting in the dove-tailed recess in the bar, a, its forward end bent down and forming a loop bearing the adjustable guide, e, and its rear end provided with the opening for the reception of the outer end of the plate, C, which is held in place by the slide, d, the forward part of said plate, C, being bent down and forming a loop having guide, e, and placed directly above the loop in the plate, B, as herein described for the purpose specified.

76,048.—Application of an Inner Sole to a Last.—Charles Buffum, Lynn, Mass.

I claim, in combination with a last, devices substantially as described, or their equivalents, for centralizing and holding a sole to the last, the same consisting of the sockets and their springs, and the pins therefore.

Also, the arrangement of the holding socket and its spring, at the toe of the bottom of a last, so as to enable a person, by means of a pin, as described, to secure the upper of a shoe to an insole by passing the pin through the upper and into the socket and spring, as set forth.

Also, the mechanism or combination for holding the sole to the last, such consisting of the grooved and headed pin, the socketed plate, and the plate of rubber or the jawed spring, the whole being substantially as set forth.

76,049.—Hose.—Andrew Carney, New York city.

I claim the constructing of hose, for conducting water, formed of leather or other material of sufficient strength and flexibility, joined, substantially as shown and described.

76,050.—Lever Purchase.—J. B. Case, Fletcher, Vt.

I claim, 1st, A universal joint-lever purchase or lever support, substantially as shown and described and for the purpose set forth.

2d, The lever plate, D, in combination with the trunnions, a, and block, B, and pivot, C, substantially as shown and described and for the purpose set forth.

3d, The block, B, in combination with the stand, A, and pivot, C, and any lever arm, D, substantially as shown and described and for the purposes set forth.

4th, The combination of the set screws, E E, with the groove, F, in the stand, A, and with the block, B, and lever, D, all constructed and operating substantially as and for the purpose shown and described.

76,051.—Carpenters' Plane.—E. M. Chapin and Solon Rust, Pine Meadow, Conn.

We claim the joiners' plow, constructed as described, and consisting of the

stock, A, having slotted, flanged guides, C, projecting from one side, the fence, B, screw, D, formed with a tenon, d, and fitted with a head, e, and the thumb screws, o' b, provided with collars, c, all arranged and operating in the manner and for the purpose set forth.

76,052.—CUTTER HEAD FOR TENONING BLIND SLATS.—Milton W. Clark (assignor to R. Ball and Co.), Worcester, Mass.

I claim the combination, with the head, A, of the cutters, a a' b b' and c c', arranged to operate as described, so that, at the same time a tenon is formed by said cutters, an offset may be cut in the shoulder of said tenon, substantially as shown and set forth.

76,053.—BABY JUMPER.—J. H. Coldwell, Poughkeepsie, N. Y.

I claim, 1st, Making the seat bar of a baby jumper longitudinally adjustable on its fulcrum, substantially as herein shown and described.

2d, Making a portion, H, of the railing around the seat of a baby jumper detachable, or so that it can swing open, substantially as and for the purpose herein shown and described.

3d, The arrangement and combination with each other of the base, A, ears, B, seat bar, C, adjustable plate, E, lugs, b, spring, F, and screw, d, all made and operating substantially as herein shown and described.

76,054.—CORDING ATTACHMENT FOR SEWING MACHINES.—Francis B. Contessa, New York city.

I claim, 1st, The combination with the presser bar, A, of the bracket, B, and roller, C, constructed, arranged, and operating with the sewing machine as and for the purpose set forth.

2d, The elastic thimble or band, in combination with the roll, C, substantially as and for the purposes set forth.

76,055.—KNIFE FOR CUTTING STRAW BANDS.—Frederick Coulon, Rockford, Ill.

I claim a knife having the handle, B, and blade, A, the latter being provided with an incline sickle edge, a, curved outwardly, or in a convex line, from the handle to the point of the blade, substantially as and for the purpose specified.

76,056.—MULE FOR SPINNING.—John Cumnock, Salmon Falls, N. H.

I claim the combination for operating the carriage, of a mule in manner as set forth, such consisting of the chain, C, and its impelling and guide wheels, the pinion, c, toothed sector, d, arm, g, the pin, h, and the slotted plate, k, the whole being arranged substantially as specified.

76,057.—HOSE AND PIPE COUPLING.—M. S. Curtis and W. D. Fewkesbury, New York city. Antedated March 16, 1868.

We claim a split or divided and adjustable ring clamp, constructed with its ends recessed, as at n, to receive within it a tongue or lip, m, arranged to project from the opposite end, substantially as and for action or operation as described.

76,058.—SAFETY GUARD FOR FIRE-ARMS.—Benj. B. Cutler, Boston, Mass.

I claim, 1st, The combination of the sliding rod, m, having projection, l, the pivoted plate, d o, curved pivoted lever, s, and springs, s b, all arranged within a recess in the stock, A, to operate substantially in the manner and for the purpose set forth.

2d, The auxiliary spring, b, or its equivalent, substantially as shown and described, in combination with plate, d, rod, m, and lever, s, all as and for the purpose set forth.

76,059.—MACHINE FOR BENDING CARRIAGE CIRCLES.—S. S. Daniels, Kendallville, Ind.

I claim the combination of the hollow former, A, having two or more shoulders, a1, formed upon its face, clamp, C, cam lever, D, slotted and jointed pivoted shaft, E, adjustable lever, G, and flanged and recessed followers, H, with each other, said parts being constructed and arranged substantially as herein shown and described and for the purpose set forth.

76,060.—STEAM PLOW.—J. C. Delavigne, New Orleans, La.

I claim, 1st, The construction and arrangement of the frame, A, of any desired size, in combination with the traction wheels, D, substantially as shown and described.

2d, In combination with the frame and wheels, the shaft, H, formed substantially as described.

3d, The arrangement and operation of the gangs of plows or cultivators, D, and the manner in which the same are controlled, substantially as described.

4th, The vertical protecting rods, E, substantially as and for the purposes herein described.

76,061.—COMBINED FEED TROUGH AND RACK.—Jeremiah Depue, California, Mich.

I claim the feed box, K, and rack, H, in combination with the roof, A, slats, C, button, f, and board, D, arranged substantially as herein shown and described, for the purpose set forth.

76,062.—RAILWAY CHAIR.—Arcule Elms, North Granville, N. Y.

I claim forming the chair for railroad rails in two parts, B and B', which are drawn and held together by their hooks, a a', substantially as shown and described, for the purpose of clamping and holding the rails, A, all as set forth.

76,063.—COMPRESSING AND BEATER PRESS.—George Ertel, Liberty, Ill.

I claim, 1st, The driving wheel, H, formed with a slotted bar, a, and movable tongue, a, when constructed substantially as shown and specified.

2d, The levers, W W', yokes, P and P', rope, x, collar, z, and pawl, d, all in combination, when constructed and arranged substantially as shown and specified.

3d, The driving wheel, H, levers, W W', platform, M, rock shaft, F, levers, s s' and t, pawl, d, and collar, z, of a compressing and beater press, all constructed and arranged in relation to one another and the other parts of the machine substantially as and for the purpose specified.

76,064.—HOOP SKIRT.—David H. Fanning, Worcester, Mass.

I claim in combination with the pockets, C C, and hoop, B, the clasps, D, provided with lips, b b and c c, the former extending laterally upon and clasping the edges of the pockets, as shown in fig. 2, the latter inclosing and clasping the hoop, as shown in fig. 3.

76,065.—BOOKBINDERS' ROLL.—John Feeley, New York city.

I claim a bookbinders' roll, consisting of the handle, A, which carries the revolving disk, C, and of the annular or circular type plate, D, secured to the face of the disk, all made and operating substantially as herein shown and described.

76,066.—DOOR LOCK.—P. S. Felter, Cincinnatus, N. Y.

I claim, 1st, A series of bent tumblers, a or a', in connection with a flat or saw-plate key, E, notched at the sides or edges, an arbor, D or G, and thimbles F or H, arranged to operate conjointly one arbor, D, with the other, G, when the lock is to be operated from both sides of a door, as shown, or to operate separately, each arbor with its concomitant parts, when the lock has but one keyhole, substantially as shown and described.

2d, The combination of the cam or eccentric, C, with the arbor, D or G, and thimble, F or H, and the sliding tumblers, a or a', all arranged substantially as and for the purpose set forth.

76,067.—CATTLE CAR.—Eugene Fontaine, Fort Wayne, Ind.

I claim 1st, The adjustable platform, B, in combination with the pivoted bars, b, for supporting said platform in the top of the car, and with the slotted horizontal arm, e, for holding the same in position when lowered to the center of the car, as herein shown and described.

2d, The platform, B, having the pivoted bars, b, when adjusted by means of the single longitudinal shaft, D, and the chains, C, as herein described for the purpose specified.

76,068.—SLATE FRAME.—Jas. H. Foote, Pittsfield, Mass.

I claim the case, c, in combination with the double-acting spring, e, and mortised frame, a, substantially as described and for the purpose specified.

76,069.—GAS BURNER.—C. S Ford, Philadelphia, Pa.

I claim, 1st, The application to gas burners of a universal articulated joint, composed of body, A, nut, N, and projection, P, burner, B U, and head of burner, B' B', the whole constructed and operating in the manner and for the purpose set forth and described.

2d, The peculiar construction of body, A, combined with screw, s c, for the purpose described and set forth.

76,070.—BACK AND ABDOMINAL SUPPORTER.—Mrs. John Ford, Salem, Oregon.

I claim the abdominal supporter, constructed as described, consisting of the band, B, provided with the shoulderstraps, F, and thighstraps, G, and having a gathered center, H, upon each side of which the eyeleted strips, I J, are secured, the ends of said band provided with the eyeleted strips, L, and clasps, C D, all arranged as described, whereby the supporter can be converted into a band, to be used after confinement, as herein set forth.

76,071.—STEAM-ENGINE GOVERNOR.—Leonard F. Fuller, Providence, R. I.

I claim, 1st, The disk, M, and tongue, L, in combination with the frame, N, substantially as herein described, and for the purpose set forth.

2d, The combination of the segment gear wheel, F, gear wheel, G, and barrel, H, arranged substantially as specified and for the purpose set forth.

4th, The spring, S, with tongue, L, substantially as described, and for the purpose set forth.

76,072.—PUMP.—G. W. Gardner and Oliver Higgins, Napoleon, Ohio.

We claim, 1st, The internal movable cylinder, H, having diaphragm, h, and openings, n m' a a', in combination with the pistons, I I', and passage, g, all as and for the purpose set forth.

2d, The tube post, A, in combination with the internal movable cylinder, H, lever, C, barrel, G, pump rod, D, and pistons, I I', as and for the purpose set forth.

76,073.—COMBINED HAY SPREADER AND COCKER.—R. T. Gill, Poughkeepsie, N. Y.

I claim, 1st, An improved machine for cocking and tedding hay, formed by the combination of the gatherer, G H J K, and carrier, L, or their equivalents, with the receiver box, N, having an upper grate, S, a lower grate, Y, and a swinging door, n', substantially as herein shown and described.

2d, The receiver box, N, furnished with an upper grate, S, a lower grate, Y, and a swinging door, n', substantially as herein shown and described.

3d, The combination and arrangement of the arm, y', connecting rod, Z, lever, W, connecting rod, V, and lever, U, with each other and with the grate Y, grate, S, and swinging door, n', substantially as herein shown and described and for the purpose set forth.

76,074.—SORGHUM EVAPORATOR.—Thomas Gillespie, Jr., Paulding county, Ohio.

I claim the combination of the furnace, A, tubes, B, and tank, C, substantially as described.

76,075.—WAGON JACK.—T. L. Goble, Orange, N. Y.

I claim the combination of the base bar, A, stationary standard, B, pivoted notched bar, C, pivoted eccentric lever, D, and pivoted standard, E, with each other, substantially in the manner herein shown and described and for the purposes set forth.

76,076.—SEWING MACHINE.—A. W. Halbert (assignor to himself and J. F. Stark), Taylor, N. Y.

I claim, 1st, The driving wheel, C, the shuttle carrier, e, connected therewith by the wrist, d, and the oscillating shuttle guide box, g, pivoted by the tubular pivot, k, constructed, arranged, and operating substantially as and for the purpose herein described.

2d, The combination of the wheel, C, the shuttle carrier, e, the feed lever, m, the slide gage, n, and the feed plate, o, all arranged and operating substantially as and for the purpose herein described.

76,077.—BED BOTTOM.—L. K. Hawes, Whitewater, Wis.

I claim, 1st, Slat, A, elastic strap, B, bent staple, C, and clamp, D, in combination, substantially as described.

2d, Securing strap, B, to slat, A, by the serrated clamp, D, substantially as described.

3d, Staple, C, with button, E, in combination, substantially as described.

76,078.—HORSESHOE.—A. S. Hopson, Plainview, assignor to himself and S. C. Harlan, Red Wing, Minn.

I claim, in combination with the horseshoe, having slots or openings at the toes and heel, the calks, when provided with a rib or projection, and secured by wedges or keys, substantially as and for the purpose specified.

76,079.—BOOT CRIMPER.—A. J. F. Howard, Milford, Mass.

I claim the construction of the movable jaws, f f, that is, as made with the elongated shanks, g g, for the purpose of lowering the jaws, f f, below the top of the clasp, a, and forming the spaces, h h', as and for the purposes before described.

76,080.—FASTENING FOR CARRIAGE CURTAIN.—J. Huston, Jr., and O. W. Stanford, Sharonville, Ohio. Antedated March 23, 1868.

We claim the plates, A and B, and thumb nut, C, in combination with spring catch, D, constructed and operating substantially as and for the purpose described.

76,081.—GATE.—J. L. Janeway, Flemington, N. J.

I claim the employment, in combination with the sustaining post, A, and gate, of the swivelling caster wheel stands e d e d, the whole arranged and operating as described, for the purpose set forth.

76,082.—BELT HOOK.—F. J. Jones (assignor to himself and Adolph Dick), Detroit, Mich.

I claim the construction of a double hook and sleeve, substantially as and for the purposes herein set forth and described.

76,083.—SHAFT BEARING OR MILLSTONE BUSH.—S. Kime, McVeytown, Pa.

I claim, 1st, The arms, D, hung at one end to studs, e, and bearing at their opposite extremities the friction rollers, B, when said arms are provided with adjusting screws, g, passing transversely through them, and adapted to rest against the inner face of the side of the box, A, all constructed, arranged, and operating as and for the purpose specified.

2d, The stuffing box, H, and follower, G, substantially as shown and described, in combination with the box, A, containing the rollers, B, and hinged arms, D, all substantially as shown and described, and for the purpose of being used as a millstone bush, all as set forth.

3d, The set screw, g, in combination with the hinged arms, D, rollers, B, box, A, and stud, e, substantially as shown and described, for the purpose of adjusting the rollers, B, all as set forth.

76,084.—MATCH BOX.—J. Kirchfield and F. Heyl, Riegelsville, Pa.

We claim, 1st, The wheel, Dx, fitted in the box, B, in connection with the opening in the end of the box, and the slide, g, all arranged substantially as and for the purpose specified.

2d, The cutter, e, attached to the lid, D, in connection with the opening in the end of the compartment, c, substantially as and for the purpose set forth.

3d, The combination of the box, B, hinged lids, A D, wheel, Dx, slide, g, and cutter, e, all arranged substantially as and for the purpose set forth.

76,085.—UMBRELLA.—Wm. Lang, Brooklyn, E. D.

I claim the umbrella runner provided with a fastening device consisting of the channel, a, and catch or lever, D, in combination with the projections, B, substantially as described.

76,086.—SCISSORS SHARPENER.—W. H. Leach (assignor to himself and S. L. Pressey), Dorchester, Mass.

I claim the inclined file, C, in combination with the parallel blocks, A B, screw or screws, D D, and spring, d, all constructed, arranged, and operating substantially as and for the purpose set forth.

76,087.—COMPOUND FOR WELDING AND REFINING IRON AND STEEL.—Julius Lehmann, Ill.

I claim a composition for welding and refining steel and iron, and for restoring burnt steel, made substantially in the manner and of the ingredients herein set forth.

76,088.—FORMATION OF JOINTS OF STEEL OR IRON PLATES.—E. F. Ligon, Demopolis, Ala. Antedated March 20, 1868.

I claim the application of the coating of copper to the bent-over edges of steel or iron plates, as described, for the purpose of forming a tight joint, less liable to oxidation than steel or iron, as herein shown and described.

76,089.—LAMP BURNER.—John Magee, Chelsea, Mass.

I claim a stationary cone, B, in combination with a perforated chimney-holder, E, all constructed and arranged substantially as and for the purpose set forth.

76,090.—SHUTTLE.—E. P. Marble, Sutton, Mass

I claim the spindle, B, and head, C, provided with the inclines, as shown, in combination with the volute spring, D, arranged and operating as and for the purpose set forth.

76,091.—SWING.—Samuel E. Martin, Shamokin, Pa.

I claim the car, C, suspended by rods, D, from transverse bars, B, the lower ends of the rods, D, being adapted to turn upon wrist pins, E, fixed in the sides of the car, C, when the two rods, D, supporting each end of the car, are fitted to turn upon one of the transverse bars, B, as described, whereby, as the car, C, is swung back and forth, its horizontal position is retained.

76,092.—JOURNAL BOX.—I. D. Mathews, Worcester, Mass.

I claim, 1st, The combination with the inner box, I, of the shell, F, substantially as and for the purposes set forth.

2d, The combination with the shell, F, and the points or projections, g g, of the collars, O O, and oilers, I I, substantially as and for the purposes set forth.

3d, The combination of the bearing or journal box of a shaft, of one or more collars, O, and oilers, I, substantially as and for the purposes set forth.

4th, The combination of the points, g g, with caps, F' F', and the top part, L, of the box, I, substantially as and for the purposes set forth.

5th, The combination of the oilers, I I, with the collars, O O, as described, whereby they draw against the points or projections, g g, which scrape the oil from the oilers, as set forth.

6th, The combination of the shell, F, and caps, F' F', with the collars, O O, and oilers, I I, and shaft, N, substantially as and for the purposes set forth.

76,093.—CARVING MACHINE.—Alexander McCreight, Tranquility, Ohio.

I claim the pivoted lever, I having the curved slot, L, fitting upon the pin wheel, J, said lever connected to the pivoted tool stock, O, by means of the adjustable bar, M all operating as described, whereby the curved slot in the lever, I, by the operation of the pin wheel, imparts a vibrating motion to the cutters, P, to form the slots, U, as herein shown and described.

76,094.—CAST-IRON CHIMNEY.—A. W. McMillen (assignor to himself and A. Adams), Chicago, Ill.

I claimed, 1st, The cylindrical cast-iron chimney, constructed substantially as described.

2d, Constructing and connecting the several sections, B, substantially as described.

3d, Connecting and supporting the section, A, with and upon the base, C, by means of the collar, I, substantially as specified.

4th, Connecting the section, D, with the base, C, substantially as and for the purposes specified.

5th, The soot box, F, with or without the opening, H, in combination with the sections, A B, and base, C, substantially as described.

6th, The adjustable shield or cap, E, in combination with the sections, A B D, and base, C.

7th, The guard, G, in combination with the sections, A B, and base, C.

76,095.—END GATE FOR WAGONS.—Enos S. Miller, Baltimore, Ohio.

I claim the combined gate and feed trough, constructed as described, and consisting of the bottom, m', having end pieces, B, adapted to receive pieces l n, and provided with buttons, g, and hooks, h j, when said pieces, B, are notched at, l, to fit over the projections, f', of the slotted rest bar, f, and are furnished with spring hooks, e, which catch under pins, d, fixed in the sides, A, of the wagon body, all arranged and operating as described for the purpose set forth.

76,096.—WINDOW-SASH FRAME.—James H. Osgood, Boston, Mass.

I claim the combination, with the sash or frame respectively, of grooves, d, constructed as described, and the rollers, e mounted on fixed bearings, and operating together as and for the purpose herein described.

76,097.—FIRE ESCAPE.—John Paar, New York city.

I claim the metallic or non-combustible box, f g h, doors, K K K', ladder, I, and metallic balconies, L, combined and arranged together substantially as and for the purposes described and set forth.

76,098.—IRONING TABLE.—Horace Park, Columbus, Ohio.

I claim the combination of the top, A, bridge, C, braces, D, rack, B, and legs, F, all arranged as described.

76,099.—RADIATING DRUM STOVE.—J. H. Patterson, Glen's Falls, and R. B. Northrup, Sandy Hill, N. Y.

We claim the construction and arrangement of the semi circular drums, D D', at the top and bottom of the stove, corresponding to its back, B, and connected by means of the vertical pipes, E, and pipe, F, the latter extending through the drum, D, to the chimney, and said drum connected to the stove by the pipe, G, as herein described for the purpose specified.

76,100.—ORE CRUSHER.—J. Reese (assignor to himself and R. C. Totten), Pittsburgh, Pa.

I claim, 1st, The crushing jaw, e', provided with the square opening, d, in combination with the cam, o', friction roller, m, and adjustable jaw, e, all constructed substantially as shown and described.

2d, A square head or T-head bolt, e', in combination with a corresponding-ly-shaped groove, s, in a stationary jaw for adjusting the stationary jaw of an ore crusher, substantially as set forth.

76,101.—PRESS.—C. O. Ritchie and J. H. Ritchie, North Madison, Ind.

We claim an improved press, composed of the mattrix, G, provided with binding rods, c c, the follower, E, the slotted uprights, B and C, with their set screws, and the cam lever, D, all combined and arranged substantially as and for the purposes shown and described.

76,102.—PORTABLE FENCE.—W. E. Roberts, North Coventry, Pa.

I claim the post composed of the uprights, B, cleats, C, base, D, and pins, G, for the purpose and substantially as herein specified.

Also, the stop, E, and button, F, for the purpose and substantially as herein described.

Also, the combination of the rails, A, uprights, B, cleats, C, base, D, stops, E, buttons, F, pins, G, and cleat, H, when constructed in the manner and used for the purpose substantially as herein specified.

76,103.—WOOD BORING MACHINE.—Almon Roff, Southport, Conn.

I claim, in combination with a central stationary screw or shaft, the feed nut, E, whether locked to the rotary arms, or operated by the crank, L, constructed to operate substantially as set forth.

76,104.—NAIL MACHINE.—George W. Sargent, New York city.

I claim the levers, C and D, connecting rods, 1, 2, 3, 4, 5, wheels, A' and E, with eccentric pins, F F' F'', arranged to operate the wooden shank and vertical hammer, G, adjustable anvil, H, horizontal hammers, F F', and cut-off bar, I, substantially in the manner and for the purpose set forth and shown in the drawings.

76,105.—STEERING APPARATUS.—Charles H. Sawyer, Buxton, Me.

I claim the steering apparatus, as herein described, having the wheel shaft, B, with its right and left screw, d, and the two small double gears, a b, the larger gear, D, with the teeth on the inner periphery thereof, as and for the described purposes.

76,106.—STOP COCK.—Carl Schultz and Thos. Warker, New York city. Antedated March 19, 1868.

We claim the stop cock, herein described, the same having its body constructed of glass, or other vitreous material, with a valve, B, provided with recess, b, and lips, l, for connection to the operating stem, and with a lateral passage, d, beyond the valve seat of the supply channel, a, the same valve thus having two faces and two seats, and closing the passage, a, by its direct thrust, and the channel, d, by its lateral expansion, when all parts are constructed and operating substantially as described.

76,107.—VEGETABLE COLORING MATTER.—Dr. Charles Seidel, New York city.

I claim an indelible vegetable fluid, having for its basis the pigment of the cashew nut, as a new combination of matter, substantially as and for the purpose described and set forth.

76,108.—WATCHES FOR CANES, UMBRELLA HANDLES, ETC.—Simon B. Simon, Washington, D. C.

I claim the arrangement of the extension movements, A, B, C, D, E, G, H, J, K, L and M, combined and operating between the plates, W and T, as herein described and for the purpose set forth.

76,109.—SILK CLEANING KNIFE.—George Singleton, Paterson, N. J.

I claim the improved parallel-acting silk knife, composed of the blade, S, holder, B, and plate, A, the blade, S', holder, E, foot, F, slotted hole, I, screw, H, lugs, K and L, screw, M, combined and arranged in the manner and so as to operate substantially as set forth.

76,110.—BOX AND BAGS FOR PACKING BUTTER, ETC.—John D. Smedley, Chicago, Ill.

I claim, 1st, The process of preparing paper boxes and paper bags for the purpose of packing lard butter, or fluids of an oleous character, in the manner as herein described.

2d, As a new article of manufacture, a paper box or bag, when constructed and prepared in the manner and for the purpose herein described.

3d, Hermetically sealing paper boxes, when constructed and prepared as herein described, by means of creases, d, and a mixture of wax and stearine, substantially as herein set forth.

4th, Lining a containing vessel, to hold packages of perishable substances, with a paper bag, when constructed and prepared in the manner herein set forth.

5th, Packing butter, lard, etc., in containing vessels, either in bulk or packages, when said containing vessels are lined with paper, or its equivalent, prepared in the manner herein described.

76,111.—MAKING HAND AND OTHER CARDS.—E. L. Sprague (assignor to himself and Henry Eddy), Leicester, Mass.

I claim, 1st, A card sheet for supporting the teeth, a, in hand and other cards, made of three strips or veneers of wood, substantially as and for the purposes set forth.

2d, A card sheet made of one or more strips or veneers of wood, and one or more thicknesses of leather.

3d, A card sheet made of two or more veneers or strips of wood, so arranged and glued or cemented together as to have the grain of the wood of the separate veneers cross each other at right angles, or nearly so, for the purposes stated.

76,112.—CAR COUPLING.—Theophilus Steinhauer, Syracuse, N. Y.

I claim an improved self-acting car coupling, formed by the combination of the body, A, and hopper-shaped mouth, B, bars or rods, C, springs, D, plate, E, coupling pin, F, coupling link, G, plate and pin guide, H, and plug, I, with each other, and with the body of coupling, said parts, A, B, C, D, E, F, G, H, I, being constructed and arranged substantially as herein shown and described, and for the purpose set forth.

76,113.—THREAD AND TWINE CUTTER.—J. W. Strange, Bangor, Me.

I claim a thread and twine cutter, constructed with a metallic stock, A, cast upon and embracing the ends of cutting blade, B, with the shields, a a, and screw, b, all substantially as described and shown.

76,114.—APPARATUS FOR CARBURETING AIR.—James Stratton, Philadelphia, Pa.

I claim the combination of the tank, A, cylinders, B and D, and the intervening cotton batting, C, substantially as and for the purpose set forth and described.

2d, The perforated pipe or hollow shaft, E, in combination with the cylinders, B and D, substantially as shown and described, and for the purpose specified.

76,115.—HYDROCARBON BURNERS.—James Stratton (assignor to himself, Wm. Wallace and Robert N. Wetherell), Philadelphia, Pa.

I claim the downward projecting straight burner, A, its lower end so perforated that the jets will flow in horizontal radial directions, in combination with the vertical pipe, B, the said parts being constructed and arranged to operate together, substantially as and for the purpose described.

76,116.—WINDOW FRAME.—Otto Edward Henry Sturcken, San Francisco, Cal.

I claim, 1st, A swing side strip, B, combined with the adjustable cord fastening, D, and grooved sash, E, all constructed and operating as described.

2d, The lock, C, in combination with the sash, E, strip, B, fastening, D, as described and for the purposes set forth.

76,117.—CLOCK.—S. B. Terry (assignor to himself and Waterbury Clock Co.), Waterbury, Conn.

I claim a clock movement in which the count wheel is placed upon a shaft or its equivalent, independent and separate from the main pinion shaft, but connected therewith through pinion and gear, substantially as described for the purpose specified.

76,118.—ROCK DRILL.—James H. Thomas, Lacon, Ill.

I claim, 1st, The tube, E, having the drill, D, when secured to the cross heads, F, upon one side, by means of the ratchet wheel, g, fitting between the horizontal plates, the clamps, m, n, upon the cylinder head, as herein described for the purpose specified.

2d, The combination, with the drill, D, and the tube, E, of the plates, e e, cams, d d, piece, f, ratchet wheel, g, spring pawl, i, and inclined rod, J, and band, h, arranged and operating substantially as described.

76,119.—MOUTH PIECE FOR CIGARS, ETC.—Wm. Thompson, Dublin, Ireland.

I claim, 1st, The provision in mouth pieces for cigars and pipes, of a chamber containing cotton wool, C, or its equivalent, through which the smoke has to pass on its way to the mouth, substantially as and for the purpose hereinbefore set forth.

2d, The employment of a case for containing the cotton or other wool, constructed and operating substantially in manner hereinbefore described, with reference to figs. 3, 4 and 5, on the accompanying drawing.

76,120.—MILK SHELVES.—Wm. Veber, Jr., Shingle Creek, N. Y.

I claim the tubular shaft, A, arranged with reference to the milk pans and the building or milk house, substantially as shown and described, for the purposes set forth.

76,121.—DINNER KETTLE.—John Wagner, Cumberland, Md.

I claim a dinner kettle composed of a series of cups or vessels, fitted one within the other and connected together by the bail and suitable catches, in the manner substantially as herein shown and described.

76,122.—MACHINE FOR REMOVING BURRS FROM HAIR.—F. Waipert, Baltimore, Md.

I claim the combination of the frame, A, having feed board, D, the spring, c, pivoted board, C, and rotating covered beater, B, all constructed, arranged and operating as and for the purpose described.

76,123.—DRILL GAGE.—Wm. C. Wells, Newark, N. J.

I claim, 1st, In a drill gage, the employment of a movable or rotating blade A, in combination with a V-shaped or concentric guide, B, said blade being movable to or from the end of the said guide, above which it is placed in a line parallel with the vertical plane of the said guide, B, for the purpose of enlarging or diminishing the area of the angle which it is intended to describe, substantially as herein specified.

2d, The projection, c, on the blade, A, and projection, c', on the supporter, m, in connection with the stud screw, D, fig. 3, which conjointly forms a pivot joint, when the said parts are attached to a concentric guide, as and for the purpose shown and described.

76,124.—BREAST PAD.—Daniel K. Wertman, Centralia, Pa.

I claim the breast pads, A A, constructed as described, and consisting of the plates, e f, riveted together, the covering, d, and filling, b, when said pads are secured to the breast strap, B, by means of screws, a, all arranged as described for the purpose specified.

76,125.—STEAM JET HEAD FOR CLEANING BOILER FLUES.—Joel M. Wheeler, Oxford, Conn.

I claim, 1st, The reversible ring, B, with the stop, i, substantially as described.

2d, The combination of the parts, A B C, with the pipe, K, substantially as set forth.

76,126.—MODE OF SETTING WHEELS ON AXLES.—M. S. Wilcox, Union Mills, Ind.

I claim, 1st, The bed piece, A, and the standards, B B', in combination with the straight edge and scale, D, constructed and operating substantially as and for the purposes described.

2d, The clamp hooks, b b, in combination with the perpendicular standards B B', as and for the purpose set forth.

76,127.—POTATO DIGGING MACHINE.—Moses H. Wiley, Boston, Mass.

I claim the combination and arrangement of the reciprocating screen, the excavating comb, and the rotary lifter, and the mechanism applied to each for operating it, substantially in manner as described, the whole being applied to a frame, A, and its wheels, B C, so as to be operated thereby, as and for the purpose explained.

76,128.—MEASURE FOR CUTTING DRESSES.—Susan R. Windle, Chillicothe, Ohio.

I claim, 1st, The chart provided with scales of part or its edges and surfaces, and of the herein described contour, for the purpose of facilitating the cutting of dress patterns, as specified.

2d, The dart point, H, and inner dart point, H', of smaller dimensions and scales upon their edges, for measuring the parts of the pattern cut out, substantially as and for the purpose set forth.

76,129.—UMBRELLA.—Wm. W. Winter and Theodore Mueller, Philadelphia, Pa.

We claim the expanding drip-cup, C, the ribs of which form the loose ends, d, of a series of springs, s, in combination with the closing ring, c, substantially as shown.

76,130.—Engine Lathe for Turning Shafting.—Aurin Wood, Worcester, Mass.

I claim, 1st, The combination with the auxiliary rest, E, of the slide pieces E' H, and hinged adjustable tool rests or supports, G G' and H', substantially as and for the purposes set forth.

76,131.—Steam Engine Valve Gear.—De Volson Wood and Stillman W. Robinson, Ann Arbor, Mich.

We claim the combination and arrangement of the piece, C, tappet, B, and piston rod, A, as and for the purposes described.

76,132.—Post-hole Hollow Auger.—Samuel H. Yoker (assignor to himself and Marion E. Clark), Tipton, Ind.

I claim, 1st, Principal cutters, x x, pivoted on rim, P P, by pivots, n n, in combination with hollow auger, D.

2d, The cutters, x2 x2, with slots, H H, in combination with pin, K, in principal cutters, x x, substantially as herein set forth and for the purposes specified.

76,133.—Compound for Use in Safe and Powder Magazine.—Edward H. Ashcroft, Lynn, Mass.

I claim the salts or chemical compounds herein described, with or without liquid acids, or any other material substantially the same, as and for the purposes set forth.

76,134.—Tanning.—Henry W. Adams, Milton, Pa.

I claim the use of the revolving tanners, E F G, armed with pins and working partially submerged in tan liquor, in the vats, B C D, for the purpose of tumbling hides and skins against the said pins, and forcing out the exhausted water from their centers, and working into them fresh tannin, substantially in the manner and for the purposes set forth.

76,135.—Harvester Cutter.—E. M. Allen, Darlington, Md.

I claim securing knives to cutter bars of reapers or mowers, by means of the elasticity of said knives, substantially as and for the purposes herein set forth

76,136.—Hot-air Furnace.—Jonathan Amory, West Roxbury, Mass.

I claim the combination of the fire chamber, B, the combustion chamber, C, the curves, D and E, and the heating tubes, F, constructed and arranged substantially as described.

76,137.—Straw Cutter.—J. J. Andrew, Saltilloville, Ind.

I claim the shaft, B, provided with its balance wheel, screw thread and crank, in combination with the knife, E, and bar or rod, J, as and for the purpose set forth.

76,138.—Inkstand.—Herbert L. Andrews, Chicago, Ill.

I claim, 1st, The reservoir, B, provided with one or more projections, a, in combination with the guard, D, provided with corresponding indentations and annular grooves beneath, substantially as specified.

2d, Raising a ridge or border around the upper surface of the lid or cover, so as to make it concave or dish form, to form a cup to hold loose pens, substantially as described.

76,139.—Steam Engine.—Nathan Atherton, Philadelphia, Pa.

I claim the curved ring, C R, beveled wheels, B V and B V', cross head, C H, guide, G, and piston rod, P R, all arranged as described, for the purpose of changing reciprocating motion into rotary, and producing a continuous motion at right angles, and overcoming friction.

76,140.—Steam Engine.—Cyrus W. Baldwin, Boston, assignor to Lafayette Huntoon, Milford, Mass.

I claim the arrangement of puppet valves, with reference to that class of steam engines in which two cylinders of different capacities, and exhausting from one to the other, are employed, substantially as herein shown and described.

Also, the arrangement of the valves, their casings, and the steam passages, in relation to each other, and operating essentially as before explained.

76,141.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the device herein described, to wit, the plate, A, when provided at its ends with cylindrical supports, B B', the opening, C, between said supports, and tongues, D D', for the strengthening of the supports, B B', as and for the purpose set forth.

76,142.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the device herein described, consisting of the two supporting curved surfaces, A B, the projecting arm, C, provided with the head or shoulder, D, the whole being constructed as described and constituting a new article of manufacture for the purpose set forth.

76,143.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the combinations of the bars, A A', when provided with the notches a a', with the cylinder, B, or its equivalent, as shown at fig. 3, substantially as described for the purpose set forth.

76,144.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the half cylinders, A A', when placed in relation to each other, as herein described, and secured in position by the plates, B B', when the latter are perforated so as to receive the key, C, at one of their ends, as herein described for the purpose set forth.

76,145.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the cylinder, A, when provided with the aperture, B, the flanges, C C', in which are holes, E E', for the reception of the bolt or key, F, the whole being constructed and operating as described for the purposes set forth.

76,146.—Cotton Bale Tie.—J. W. Barnum, New Orleans, La.

I claim the cylinder, A, when provided with the two projecting plates, B B', in which are cut the notches, C, as herein described, for the purpose set forth.

76,147.—Saw Gumming or Toothing Machine.—Abraham Bartholt, New York city. Antedated Oct. 1, 1867.

I claim, 1st, The combination with a reciprocating punch and suitable die, of an automatic graduating feed to the saw plate, substantially as specified.

2d, In combination with the lever, K, of a friction feed or driving device to the saw plate, the adjustable stop, L, with its ratchet wheel, N, and pawl, P, or the equivalents of these devices, for giving at pleasure a graduating or uniform feed to the plate, essentially as herein set forth.

3d, The adjustable automatic feed, constructed and operating substantially as shown and described, in combination with a circular saw plate holder and driving machanism, as set forth.

4th, The adjustable spring presser, U, in combination with a revolving plate holder and its driving mechanism, for operation in connection with a reciprocating punch, and relatively to the die thereof, essentially as shown and described for the purpose or purposes specified.

76,148.—Folding Couch.—A. John Belt, Cincinnati, Ohio.

I claim, 1st, The hinged and folding bedstead, A A', B B', C, D, E, d d', e e', capable of extension by means of the bars, F F', G, all substantially as described.

2d, The combination of hinged folding and extensible bedstead, as above claimed, with the bottom, I, either with or without the permanent mattress, J.

76,149.—Sealing Cans and Jars.—John Bellerjeau, Philadelphia, Pa.

I claim, 1st, The cap or top, C, having clasping springs, D, and the body, A, with the bevel flange, B, combined and operating substantially as described.

2d, The clasping springs, D, and hook or hinge, F, in combination with the cap or top, C, and the body, A, having flange, B, and operating substantially as described.

3d, The combination of the wedge, H, hooked bar or strip, G, and body, A, having angular flange, B, substantially as described, for the purpose specified.

76,150.—Nailing Machine.—Lyman R. Blake, Boston, and Asa S. Libby, Lawrence, Mass.

We claim a work supporting horn, substantially as described, in combination with a mechanism which operates to drive nails or pins by pressure or percussion.

Also, in the aforesaid combination, arranging the horn so that it can be rotated.

Also, in the aforesaid combination, arranging the horn so that it can yield and move in a vertical direction, substantially as described.

Also, the combination with the presser foot, of mechanism which operates by reason of any change in hight, at which the presser foot rests on the stock to automatically cut nails or pins from material supplied for that purpose, to a length proportioned to the thickness of the work at the place where the presser foot operates.

Also, in combination with mechanism by which nails are supplied to the action of a nail or pin driving mechanism, means for automatically driving the nails in a direction which is inclined in the general direction of the row of driven nails.

Also, means for automatically driving each nail in an inclined direction opposite to the inclination of the driven nail preceding, substantially as described.

Also, combining with the presser foot or other device resting on the surface of the stock, and with the nail driver, means for automatically changing the position of the operative end of the driver, so that the point to which said end will descend at each stroke will depend upon the thickness of the stock at the point where operated upon, and will have a definite relation to the surface of the stock at each descent of the driver.

76,151.—Portable Wire Fence.—Louis W. Bosart, St. Marie, Ill.

I claim, 1st, In combination with the wires, C, a corresponding number of capstans, B, through the shafts of which the wires pass, and around which they may be wound, substantially as and for the purpose set forth.

2d, The combination of the wires, C, corner posts, D, intermediate triangular trestles, boards, F, and strips, E, constructed and arranged substantially as described.

3d, The combination of the frame, A, capstans, B, wires, C, and posts, D, arranged substantially as described.

76,152.—Printing Wall Paper.—Peter H. Bowers, Brooklyn, N. Y.

I claim in the printing of wall papers, the use or employment of natural wood, properly prepared, as a type from which to print.

76,153.—Government Revenue Stamp.—Geo. W. Bowlsby, Monroe, Mich.

I claim 1st, Stamping the cigars themselves, in bulk, substantially as described, or any colorable modification of the same, in contradistinction to stamping the box as now done.

2d, A stamp so made as to be adapted to said purpose, and substantially as described.

3d, The stamping of cigars directly upon the cut ends, to prevent damage to the body of the cigar.

76,154.—Corn Sheller.—Christian H. Brady, Mount Joy, Pa., assignor to himself and Wm. Brady.

I claim, 1st, The arrangement of the semicircular shelling plates, K, with their dividing plate, a, keel, f, in combination with the spirally inclined and curved blades, l, centrally united at P, for a pin, p, to support a coiled spring, constructed substantially in the manner shown, for the purpose set forth.

2d, In combination with my semicircular plates, K, arranged as aforesaid, the bearing plates, F, for the pin, p, said plate, F, being also provided with cross arms, E E', and bearings for the guide rods, h, in combination with the annular handled rims, C C, and their socket bearings, all arranged in the manner shown and specified.

3d, In combination with the foregoing revolving frame, the use of a stationary case, A A, with its standard, spout, and set screws, arranged in the manner shown, for the purpose set forth.

76,155.—Portable Derrick.—G. C. Brown, Philadelphia, Pa.

I claim the portable derrick composed of the head, with its cap and sheaves, sockets and legs, the whole arranged as and for the purpose set forth.

76,156.—Still.—Franklin P. Bush (assignor to himself and Jeptha Garrard), Cincinnati, Ohio.

I claim the vapor discharge pipe, D, inclosed within the cold blast pipe, E the whole being arranged and adapted to operate in the manner and for the purpose set forth.

76,157.—Telegraphic Indicator.—Edward A. Calahan, Brooklyn, N. Y. Antedated March 23, 1868.

I claim, 1st, The transmitting instrument, formed of a disk, in combination with the arm, c, and undulating edge of the metallic ring, the parts being connected and operating as and for the purposes set forth.

2d, The escapement and arm, constructed as specified, in combination with the armature, magnet, clock work, and dial, as and for the purposes specified.

76,158.—Hair Picker.—Frank Calvert (assignor to himself and Stephen W. Huse), Lowell, Mass.

I claim, 1st, Untwisting hair rope by running it the reverse from the twist, so that the untwisted part may be operated upon continually and simultaneous with the untwisting, for the purposes substantially as described and set forth.

2d, The radiating concentric toothed cylinder, g, in combination with the can or hair receptacle, y, for the purpose as described and fully set forth.

3d, The can or hair receptacle, y, with its nose, a', or their equivalents, when arranged to operate substantially as described and fully set forth.

4th, The application and arrangement of the fan and cleaner, q, clearer or finisher, j, radiating concentric toothed cylinder, g, fluted draft and feed rolls, r and r', s and s', t and t', and hair receptacle, y, when arranged to operate substantially as described and fully set forth.

76,159.—Coupler for Organs, etc.—R. W. Carpenter, Chicago, Ill.

I claim a simple lever coupling formed from a single rod bent and applied substantially in the manner shown and described.

76,160.—Shingle Machine.—J. F. Chambers, Calistoga, Cal.

I claim the combination and arrangement of the dog, b, movable table, U, eccentric shaft, a, levers, W, for clamping and holding the shingle while it is being shaved; and in combination with the parts above claimed, the sliding frame, h, and knife, l, for shaving the shingle.

Also the combination and arrangement of the flat shaft, c, pinion, g, wheel f, ratchet, e, and pawl, d, to alternately raise and lower the end of the table, U, to shave the shingles tapering.

76,161.—Tooth Plugger.—Edwin Coburn, Jr., Lewiston, Me.

I claim, 1st, The rod, c, passing longitudinally through the cylinder, C, and having its cords, d and e, for the purpose of making the tool double in its operation, as herein set forth.

2d, In connection with the rod, c, the hammer, l, with its hinged spring arm, k, and the inclined piece, o, as and for the purposes set forth.

3d, The means of making the rod stationary, as shown in figs. 1 and 4, as described.

4th, The method of stiffening the coil, d, as shown in figs. 1 and 3, as set forth.

5th, Constructing a tooth plugger as described, so that the blow of the hammer, l, shall operate to compress the filling of a tooth when either a pulling or pushing force is applied, in the manner and for the purposes herein described.

76,162.—Tug Buckle.—George P. Cole, Hudson, Mich.

I claim the plate, A, as constructed in combination with a bolt, F, made adjustable as described, substantially as and for the purpose herein fully set forth.

76,163.—Sleigh Bell.—Ezra G. Cone, East Hampton, Conn.

I claim the combination with the two open mouthed bells, A B, of one or more loose or detached "jingles," b, substantially as and for the purposes herein specified.

76,164.—Globe Valve.—Wm. S. Cooper, Philadelphia, Pa.

I claim, 1st, The arrangement of the cap, C, valve, n, of the spindle, W, the washer, r, spring, K, central guide piece, G, and key P, with reference to the body, B, substantially as specified and described.

2d, The combination and arrangement of the central guide piece, G, valve, v, and tube, T, with the body, B, substantially as described and specified.

76,165.—Lubricating Composition.—Joseph Cordnan, Brooklyn, N. Y.

I claim, 1st, The use of asbestos, substantially as and for the purpose described; and

2d, The use of asbestos in combination with plumbago or other known lubricating substances, being mixed with a glutinous material, substantially as and for the purpose described.

76,166.—Fluid Indicator.—Joseph Cordnan (assignor to himself and R. W. Potter), Brooklyn, N. Y.

I claim, 1st, A screw composed of blades, of a spiral tapering form, in combination with a conical-shaped vessel or surface adapted to such screw, and a registering mechanism, substantially as and for the purpose herein described.

2d, The employment in the ends of the spindle of said screw, of horned recesses, substantially as and for the purpose described.

3d, The arrangement of the registering mechanism around the spindle of the screw, and within the body of the indicator, substantially as and for the purpose described.

4th, The construction of the registering mechanism substantially as described, so as to form an endless screw throughout, and thereby overcome friction and increase the facility of the indicator to register.

5th, The arrangement of gauze wire work within the induction aperture, substantially as described, in order to prevent substances from passing into the indicator.

6th, The arrangement of gauze wire work within the eduction aperture, so as to destroy the circular motion that the fluid receives in passing through the indicator.

76,167.—Manufacture of Cheese.—Wm. S. Cornell, New York city.

I claim, 1st, In the manufacture of cheese, concentrating the milk by evaporation preparatory to introduction of the rennet, or substitute therefor, substantially as specified.

2d, The formation in vacuo of the curd from which the cheese is made, essentially as herein set forth.

3d, In the manufacture of cheese, retaining the butter usually lost in the whey, by evaporating the latter from the curd, substantially as specified.

76,168.—Sap Bucket.—J. W. Currier, Newbury, Vt.

I claim the cover, C, provided with a bridge or support, D, and springs, E, for attachment to a bucket, all arranged, combined, and operating substantially as shown and described, for the purpose set forth.

76,169.—Box or Case for Scale Beams.—Augustus B. Davis, Philadelphia, Pa.

I claim, 1st, A box or case constructed substantially as described, in combination with a scale beam contained within the box, and having one or more sliding bars, which can be drawn through a slot in the box to an extent limited by a stop on the said bar or bars, as set forth.

2d, The within described box having two doors, one on each side, in combination with a scale beam graduated on both sides, as set forth, for the purpose specified.

76,170.—Window Shutter Holder.—Charles R. Doane, Williamsburg, N. Y.

I claim the fastener, C, applied between the parts of the shutter hinge so as to vibrate on the pivot thereof, and constructed so as to operate substantially as herein described.

76,171.—Boring Machine.—Hugh Dool and Philo B. White, Dowagiac, Mich.

I claim the adjustable shaft, K, provided with the wheels, E and F, of different diameters, in combination with the horizontal shaft, B, provided with an adjustable wheel, D, when constructed and used substantially as and for the purpose specified.

76,172.—Ditching Machine.—Alex. C. Decker, Bushnell, Ill.

I claim, 1st, The shovel, D, constructed as described, with cutting edge, d d1, arms, d6, and shoe, d2, in combination with clevis, R, rod, r, chains, d4, rollers, d3 d5, levers, u u1, and racks, u2 u3, substantially as described.

2d, The frame, A, constructed as described, frame, B, buckets, M, wheels, K, and roller, L, when combined and arranged as and for the purpose set forth.

3d, The shaft, F, shaft, G, shaft, H, wheel, I, with driving shaft and spur wheels, when combined and operated in the manner set forth.

76,173.—Explosive Powder.—G. Designoble and John Casthelaz, France.

We claim the application and use, substantially as described, of picrate or carbazote of potassa, as well as the salts formed from picric or carbazotic acid, and also the derivatives from such acid, and the acid itself, in and to the manufacture of powder, under the reservations set forth.

76,174.—Rotating Fan.—I. S. Eastman, Madison, Wis.

I claim the combination of the rotating shaft, B, cylinders, C and C'', suspended from the ceiling above, and provided with arms, 1, 2, 3, so arranged as to be held at any adjusted hight by means of cord, E, and clasp, F, substantially as and for the purpose described.

76,175.—Warming Cars on Railways.—George W. Eddy, Waterford, N. Y.

I claim, 1st, The combination of the main pipe, P, for conveying a portion of the steam directly through the car, and auxiliary pipes, C, for conveying a portion of the steam around under each seat, and back into the main pipe, P, when said pipes are arranged substantially as described.

2d, The combination with the pipes, P and C, the check or valve, a, arranged substantially as and for the purpose set forth.

76,176.—Medical Compound.—M. C. Edey, New York city.

I claim the medicinal compound above described.

76,177.—Brewing Beer and other Malt Liquors.—Wm. H. Elliot, New York city.

I claim, 1st, Condensing the vapors of the boiling wort, and returning them to the boiling tank as fast as condensed, and afterward cooling the condensed vapors and the wort together by passing them through an inclosed surface cooler, as herein specified.

2d, The combination of an inclosed surface cooler with a boiling tank which is provided with a condenser for condensing the vapors of the wort, and with a pipe for conducting the condensed vapors back to the boiling tank as fast as condensed, as herein specified.

76,178.—Apparatus for Dyeing and Bleaching Yarns and Thread.—William H. Elliott, New York city, and Isaac Osgood, Utica, N. Y.

I claim, 1st, Grooves, flutes, or corrugations, l and l', for conducting dye and other liquids to the interior of a cop of yarn, when employed substantially as herein described.

2d, The grooved or fluted bobbin, d, when employed substantially as and for the purpose herein specified.

3d, Grooved or fluted skewer, g, when employed substantially as and for the purposes herein set forth.

4th, The cup-shaped receivers, c, through which the liquids pass from the conducting pipes to the cops, substantially as specified.

5th, The combination of the receiver, c, with the bobbin, d, when the receiver is made to embrace a portion of the bobbin, substantially as and for the purpose herein specified.

6th, The combination of spring, n and n', with the upper receivers to adjust them to the length of the cop or bobbin, substantially as and for the purposes set forth.

7th, The follower, m, and spring, n, in combination with bobbin, d, substantially as and for the purposes specified.

8th, The combination of an upper adjustable receiver with a lower receiver, when constructed substantially as specified.

9th, The employment of a fluted or grooved skewer, in combination with a perforated cop tube or bobbin, substantially as described.

10th, The metallic bobbin or spool head, e, when struck up so as to form an inner and outer cylinder, in combination with corrugated or perforated body, d, substantially as specified.

11th, The combination of corrugations and perforations in the same body, substantially as and for the purpose specified.

12th, The employment of a skewer for supporting a bobbin, cop tube, or spool, in combination with the receivers, c, substantially as and for the purpose herein specified.

76,179.—Dirt Scraper.—Henry J. England, Delhi, N. Y.

I claim, 1st, The levers, d d', rods, e e', springs, g g', and catches, f f', in combination with a shovel dirt scraper, when constructed in the manner and for the purposes set forth.

2d, The projecting pieces, a a' and 1 1', in combination with a shovel dirt scraper, when constructed in the manner and for the purposes set forth.

76,180.—Steam Generator.—A. S. Foster, Indianapolis, Ind.

I claim, 1st, The arrangement of a flue boiler of sections, whereby the bridges of one section are opposite the flues of the adjacent section, substantially as set forth.

2d, The combination of all the several parts in one device, when constructed and used substantially as set forth.

76,181.—Apparatus for Cooling Liquids.—Harvey C. Fowler, Great Bend, Pa.

I claim my improved apparatus for cooling liquids, consisting substantially of a narrow refrigerating space, extending radially from and beneath an upper inlet aperture, and communicating with an outlet aperture, said space being inclosed between concentric or parallel walls surrounding a central coil air chamber, which communicates with an outer inclosing ice chest.

Also, the combination of diffusing flanges, s s, with the inner surface of the upper or lower walls of the refrigerating space, e, of my apparatus, substantially in the manner and for the purpose herein set forth.

76,182.—Apparatus for Generating Illuminating Gas.—George P. Ganster, New York city.

I claim, 1st, In an apparatus for generating gas from volatile hydrocarbons, the combination of the air forcing apparatus and carbureting apparatus, in the manner described and shown.

2d, Filling the compartments of the meter wheel with any suitable capillary material, for the purpose of enriching the air with the hydrocarbon with which the capillary material is saturated.

3d, A valve placed on the inlet pipe of the apparatus, so arranged as to close the opening when not in operation.

76,183.—Thill Coupling.—G. H. Gardner, Philadelphia, Pa.

I claim the thill iron, C, having the eccentric head, F, and inclined slot, D, in combination with the clip, B, united by the bolt, e, and the rubber, E, all constructed and arranged as described.

76,184.—Truss.—John Glydon, New York city.

I claim, 1st, The combination of the rigid plate, g, slotted to receive the spring, with the spring, i, and the swiveling pad, e, substantially as described.

2d, The arrangement and combination, in a truss for inguinal rupture, of two pads, e e, for the purpose of securing stability of position, with or without the supplementary protecting pad, f, substantially as described.

3d, Making the body spring or band of the truss, which incircles the body of a patient, in two independent parts, a a, connected and adjusted to each other, substantially as above described.

76,185.—Churn.—E. T. Harlan, Star City, Ind.

I claim the combination of the winch and crank, the pitman, E, segment E', and pinion, G, for communicating both a vertical and rotary reciprocating action to the dasher, substantially as set forth.

76,186.—Mode of Packing Neckties.—William H. Hart, Jr., Philadelphia, Pa.

I claim, 1st, The holder, A, provided with the yielding tongues, a, for supporting and exhibiting the necktie or cravat, substantially as described.

2d, The combination, with a cravat holder or show card, of one or more bands, cords, or other fastenging, whereby the cravats may be securely retained in position without protruding through the card, substantially as described.

3d, The construction of the box body or frame, D, with ledges or supports, d, to adapt the show card or holder to be used as a bottom to the box, substantially as described.

76,187.—Meat Chopper.—Nehemiah L. Hatch (assignor to himself and J. W. Gavett), Cape Elizabeth, Me.

I claim, 1st, The sliding frame, a, with crank, f, shaft, e, gears, g h, crank shaft, i, jointed driving rod, j, balance wheel, n, and handle, o, in combination with the railed tray, substantially as described.

2d, The sliding frame, a, with the shafts, e and i, crank, f, gears, h g, knife, l, and jointed rod, j, in conjunction with wheel, n, pawl, r, spring rod, s, pawl, t, ratchet, q, shaft, p, cord, u, and post, all in combination with the railed tray, as and for the purposes set forth.

76,188.—Earth-boring Auger.—J. Wilson Heath, Memphis, Tenn.

I claim, 1st, The combination of the valve, a, with the slotted stem, b, pin, f, hollow shaft, s, and inlets, t t, all constructed, arranged and employed substantially as and for the purposes specified.

2d, The collar, g, when used in combination with a double spiral earth auger, as and for the purposes stated.

3d, The coupling, h i j j1 j2, constructed and arranged as described and for the purpose specified.

76,189.—Stone-Drilling Machine.—Levi Hermance, Hudson, N. Y.

I claim, 1st, The arrangement of the slotted plates, n n, connecting bars, T T, and sleeve, J, in combination with the wheels, E E, having grooved pulleys, s s, on their inner faces, the whole arranged and operating substantially as specified.

2d, The combination of the frame, A, and its bolts, w w, with the plates, C C, having trunnion bearings, curved slots, D, and recesses, e e e, whereby the frame, A, may be placed at an angle with the frame, B, as specified.

76,190.—Gate.—Frederick M. Hickman, Rolling Prairie, Ind

I claim the combination of the hinges, C C, lever, D, and pulley, E, respectively, constructed and arranged substantially as set forth.

76,191.—Saw Mill.—H. D. Hinternesch, Baltimore, Md.

I claim bands or cords, S S', when combined directly with cranks or eccentrics upon a revolving shaft, K, and so arranged as to communicate therefrom a reciprocating movement to a scroll saw, A, substantially in the manner herein set forth.

76,192.—Dumping Wagon.—John Holmes, Johnson, Vt.

I claim the arrangement of the levers, G, connections, F, and springs, A, with their offsets, C, when constructed, combined and operating as herein described and for the purpose set forth.

76,193.—Trunk.—Calvin Horton, Somerville, Mass.

I claim a traveling trunk, the outer surface of the body of which is covered with strips of thin wood, the abutting edges of which strips are protected by the cleats or straps, substantially as described.

76,194.—Mode of Filling Marshes.—George Howell, Philadelphia, Pa.

I claim, 1st, The combination and arrangement of the case, A, with a scow or boat by means of the vertical screw rods, N, wheels, o, pinions, o', and shafts, O O1 and O2, the said parts being arranged and operating substantially as described.

2d, The combination of the links, Y Y1 and Y2, with the case, A, and scow A', for giving a parallel motion to the former, substantially as described.

3d, The combination of the vertical rods, Z Z, with the case, A, and scow A', substantially as described.

4th, The geared shifting lever, Q, arranged and operating in relation to the driving shaft, K, and shaft, O1, substantially in the manner and for the purpose specified.

5th, The combination of the chains, T, pulleys, U, standards, V, and gripes, W, with the case, A, and scow, A', for holding the case in its altitudinal position, substantially as described.

6th, The combination of the coupling rods, M and M', with the case, A, and scow, A', substantially as described and for the purpose specified.

76,195.—Gas Heater.—John S. Hull, Cincinnati, Ohio.

I claim a burner, supplied by the force of compressed air, in combination with a tinner's fire pot, for the purpose herein specified.

Also, the chambered gasifying and superheating disk, G, substantially as and for the purpose herein set forth.

Also, the screw cap, g, applied to the disk, G, substantially as and for the purpose specified.

Also, the enlarged passage, k, in the burner head, for the purpose set forth

Also, the screw plugs, l l m m, substantially as and for the purpose herein specified.

Also, the swell or dome, O, in the top of the heater, substantially as and for the purpose herein specified.

76,196.—Processes and Apparatus for the Manufacture of Iron and Steel.—Jacob Jameson, Philadelphia, Pa.

I claim, 1st, The reducing furnace, B, in combination with the chambers, D, and chimney flue, F, constructed and arranged for operation substantially as described and for the purposes set forth.

2d, The chamber, G, boiler, H, and pipes, h h', in combination with the reducing furnace, B, and chambers, D, constructed and arranged for operation substantially as described, for the manufacture or production of cast iron direct from the ore.

3d, Reducing the size and changing the form of the reducing furnace by blocks, M, arranging the chamber, G, for the production of large quantities of carbon, and introducing the carbon into the blast, and so into the reducing furnace, B, substantially as described, for the purpose of producing steel direct from the ore, as set forth.

4th, The process of treating ores, for the purpose of making cast iron or steel, in the manner and by the means substantially as herein described.

76,197.—Bolt Cutter.—Jesse Johnson, West Fallowfield Township, Pa.

I claim the compound tool herein described, consisting of the two levers, D D, working in a rack, B, with pinions; the steel knife, E, secured to the end of the rack, B, by screws or rivets, and made to slide in a slot or groove in the side of the frame, A, which keeps it in line; the stationary knife, F, made rounding on the back side, and secured in the end of the frame by a tenon; the two steel plates, C C, adjusted near the end of the levers; the set screw, G, which prevents the knives, E and F, from colliding, and on the end of which screw, G, there is a punch, constructed to work in a die on the opposite lever; the whole arranged, constructed and employed as shown in the annexed drawing.

76,198.—Thill Coupling.—Phineas Jones, Newark, N. J.

I claim the combination of the metallic spring, b b1, formed upon the thill

iron, the sleeve, E, and the tightening bolt, C, when arranged and employed substantially as and for the purpose herein set forth.

76,199.—MACHINE FOR ROLLING "COTS" ON DRAWING ROLLERS.—William C. Joslin, Putnam, Conn.

I claim the combination of the rollers, B C, feeding and delivering boards, J K, and roller, D, the latter having an intermittant motion to and from the others, all arranged for operation substantially as and for the purpose specified.

76,200.—POTATO DIGGER.—George W. Kintz, West Henrietta, N. Y.

I claim, 1st, The combination and arrangement of the revolving spiral tines, q q, and the angular teeth, o o', with the vibrating shaker, E, operating in the manner and for the purpose herein set forth.

2d, The angular vine puller, H, jointed at one end, employed in combination with the rod, I, having a free end movement, to discharge the vines, and a stay chain, u, which limits the back motion, the whole arranged and operating in the manner and for the purpose herein set forth.

3d, The construction and arrangement of the machine as a whole, consisting of the wheel, D, with cams, l l, vine puller, H, with rod, I, and chain, u, shakers, E E, with arms, m, share, G, with divider, r, and wings, s s, truck frame, B, with adjustable standard, b, and the skeleton beam, A, the whole operating as described.

76,201.—LOCK NUT.—Soloman W. Kirk, Coatesville, Pa.

I claim the within-described nut retainer, consisting of the concavo-convex ring, D, having a straight portion, y, adapted to a flat place on the stem of the bolt, and being arranged for fitting, and being jammed in the recess of a nut, all substantially as set forth.

76,202.—CHAIR AND LOUNGE.—George Knell, Moorestown, N. J.

I claim, 1st, The frames, A and B, in combination with the legs, l, the whole being arranged for adjustment, substantially as described.

2d, The combination of the above and a strap, q, or its equivalent, for the purpose of regulating the inclination of the several parts, as described.

3d, The frame, D, adapted to the frame, B, and adjustable thereon, substantially as and for the purpose set forth.

4th, The combination of the frame, B, and a sliding frame, C, substantially as and for the purpose described.

76,203.—HOT-AIR FURNACE.—Andrew Knobel, Monroe, Wis.

I claim, 1st, Providing the ash pit, a, and fire box, c, with lined openings, a' c'', extending through the outer wall, substantially as specified.

2d, The suspended gas burner, e, constructed and operating substantially as specified.

3d, Constructing the furnace in cylindrical sections, so arranged that the middle sections, s'' and t, may be removed or others added, without changing the other sections, substantially as specified.

4th, Supporting the chambered and flued portion of the furnace upon the pillars, m, and the combustion portion upon the pedestals, a,'' as described so that the combustion portion, a and c, may be removed or replaced without disturbing the heating portion.

5th, The small central chamber, f, located immediately above the gas burner, e, and fire box, c, for burning the unconsumed products of the fire below, and provided with side openings at the top, door, r, and conical inverted plate, o, substantially as specified.

6th, The combination and arrangement of the fire box, c, and gas burner, e, with the cylindrical sections, t' t'' t''' t'''' and s' s,'' divided and supported by the horizontal plates, x, x'' x''' x,'''' substantially as and for the purposes specified.

76,204.—COAL STOVE.—Andrew Knobel, Monroe, Wis.

I claim, 1st, The combination of the vertical annular flues, f o', and the flue between the cylinders, l and k, with the horizontal flues, m' and t,'' and fire box, d, substantially as specified.

2d, The removable cap, f,' in combination with the pipe or flue, f, and register cap, r, so that all of the flues can be readily cleaned, substantially as specified.

3d, The open passage, e,' opening into the fire below the gas burner, in combination with the grated gas burner, e, fire box, d, and opening, d', substantially as and for the purposes specified.

76,205.—HOLLOW AUGER.—Frederick Kraus, Philadelphia, Pa.

I claim the rest, G, and bit stock, E, when said rest and stock are operated by a right and left screw, D, in the manner herein described.

76,206.—CHURN.—Peter C. Laub, Allentown, assignor to himself and Samuel Shaffer, Williamsport, Pa.

I claim the combination of the barrel-shaped churn, B, with its inner corresponding-shaped division, B, and chamber, G, when constructed, arranged, and operated as herein described and for the purposes set forth.

76,207.—HEEL CUTTING MACHINE.—Richard C. Lambert, Raynham, Mass., assignor to David Whittemore.

I claim, 1st, A heel cutting machine, having a swinging and sliding jack, constructed and operating substantially in the manner described.

2d, The combination and arrangement of the toothed segment, E, driven as described, the sliding journal block, F, and the jack frame, G, constructed and operating as specified.

3d, The mode described of jacking the shoe or boot by means of the screw, L, operated as described, which holds the heel against the pattern, H, and the jaw clamp, I I', which confines the toe, as set forth.

4th, The manner of automatically releasing and fixing the center of oscillation of the jack by means of the levers, Q, operated by the pins, b b', and raising and lowering the sliding stop, R, as specified.

5th, In combination with the knife stock, the guides, x y, one running in the rand of the shoe, and the other in contact with the edge of the pattern, H, as described.

6th, In combination with the swinging jack frame, the wheel, K, and screw, L, constructed, arranged, and operating as specified.

7th, In combination with the swinging and sliding jack, G, the guide ways, P, for guiding and steadying the horizontal and oscillating movements of the jack, as set forth.

8th, The combination of the lever, T, pivoted and operated as described, with the ways, W, of the knife stock, to give both horizontal and vertical movements to the knife, as specified.

9th, The toe clamp, I I', constructed, arranged and operating as described.

76,208.—PLOW.—John Lane, Chicago, Ill.

I claim the particular form and construction of the slip joint, as arranged, either with or without the flange, n, and either with or without the pin cutter, m, in combination with a lay and land side welded together, as described and for the purpose shown.

76,209.—STRAW CUTTER.—John Laughlin, Gettysburg, Pa.

I claim, 1st, The gates, C F, playing in grooves in the legs, B B, and provided with V-shaped knives, constructed as specified, and used in combination with the apron, P, lever, G, handle, J, and bar, K, all constructed and operating substantially as set forth.

2d, The bar, K, provided with a friction roller, and used with the handle and frame of a straw cutter for assisting in causing the edges of the knives to bind against each other or against a cutting plate, as is herein fully set forth.

76,210.—DIE FOR HEADING BOLTS.—William J. Lewis, Pittsburg, Pa.

I claim constructing the dies, B B, and header, A, as hereinbefore described, so that said dies will embrace four sides of the bolt head, and leave two openings for the two remaining sides, and space for the surplus iron, said dies and header being so arranged with relation to each other, that by turning the bolt one sixth way round, the surplus iron and the "flash" or "fin" will be brought in contact with a solid portion of said dies and headed, and thereby be driven into the head of the bolt, substantially as herein described and for the purpose set forth.

76,211.—TABLE WAITER.—John C. Libby, Biddeford, Me.

I claim the combination of the revolving zinc waiter, A, center revolving post, F, with its waiter, C, at top, and wire waiters, E E, projecting from each side of the center post, when constructed, arranged and operated as herein described and for the purposes set forth.

76,212.—BRIDGE.—Levi Liscom, Boston, Mass., assignor to himself, Rufus S. Merrill and William Lincoln.

I claim the combination, with the double lever, constructed as herein described, of truss work, united with the said lever by means of tie bolts or rods, as herein described, so that the said lever shall in effect constitute the bottom chord of the truss, substantially as set forth.

76,213.—SOAP.—George W. Love, Jackson county, Mo.

I claim the combination of the several parts, as above named, to be used in connection with soap, for the purpose set forth.

76,214.—SKATE.—Thomas Lovelidge and John Grindrod, Philadelphia, Pa.

We claim, 1st, A skate, having an elastic foot plate and two runners, arranged to move independently of each other in a vertical direction, but to guide each other laterally, all substantially as and for the purpose herein set forth.

2d, Securing a skate to a boot solely by studs on the skate, adapted to holes in plates on the sole and heel of the boot, substantially as described.

3d, The sole plate, A, and its runner, B, in combination with the heel plate, A', and runner, B', when the said plates and runners are rendered adjustable, to suit boots of different sizes, substantially in the manner described.

4th, The studs, n n', either fixed to or arranged to slide on the foot plate of the skate, near the toe, in combination with the plate, E, on the boot, and holes so formed and arranged therein as to admit and retain the said studs, substantially as specified.

5th, The stud, m, in conjunction with a plate, D, on the heel of the boot, the said plate having a hole of the character described, into which hole the head of the stud can be introduced and in which it can be secured, either by moving the plate to which the stud is attached backward, or by moving the stud itself in a slot in the plate, all substantially as specified.

76,215.—HAY RAKER AND LOADER.—Orrin Luce (assignor to himself and Martin Luce), Virgil, N. Y.

I claim, 1st, The eccentric bar, J, when supported as described, and operating in connection with the arms, m m m, the revolving bars, I I I, and the teeth, D D, substantially as and for the purposes set forth.

2d' The combination of the independent lever, d', with the rocking shaft, d, teeth, D D, gage, E, and spring, e, substantially as and for the purposes indicated.

76,216.—LINING BOOTS AND SHOES.—Timothy Lucey, and James E. Murphy, Salem, Mass.

We claim, in combination with a jack or plate, supported at its heel on a post or standard, an elastic or yielding surface for holding a cement-applied lining, to be applied to a shoe, substantially as set forth.

Also, combining the lining plate, e, with the jack, c, and its flanges, d, or the equivalents thereof, the plate being supported upon a rod, and being raised and lowered substantially as described.

76,217.—FEED-WATER HEATER FOR STEAM GENERATORS.—George W. Mack, Hamtramck, Mich.

I claim, 1st, The vales, H, and deflectors, I, in connection with the exhaust pipe, G, when operating substantially as and for the purposes described.

2d, The combination of the above-named parts with the heater, A, the connection pipes B and F, the chambers, C and E, the coil pipes, D, and the openings, J, when constructed, arranged, connected, and operating as and for the purposes herein set forth and shown.

76,218.—COMBINATION TOOL.—J. W. Marsh, Oxford, Mass.

I claim, 1st, The combination of the jaws, A B, provided with externally-grooved conical ends, F, with the springs, D, and set screws, E, the said parts being constructed and arranged as herein described, so as to constitute a combined drill holder and countersink.

2d, The combination with the jaws, A B, whose ends, F, are provided interiorly with notches, l, for receiving and holding the head of the screw of the springs, D, with or without set screws, E, by which the screw driver, placed between the jaws, is steadied and held, the said parts being constructed and arranged for operation as herein shown and set forth.

76,219.—METHOD OF CREATING DRAFT IN CHIMNEYS BY MEANS OF STEAM.—William H. Martin, Brooklyn, N. Y.

I claim, in combination with a smoke stack or chimney, the blast head, a, constructed substantially as described, so as to deliver the steam in said stack in a circular volume or volumes, substantially as set forth.

76,220.—MACHINE FOR THREADING SCREW CAPS.—John L. Mason, New York city.

I claim the arrangement of one or more roller dies, e, secured and made adjustable in a disk or face plate, C, in combination with the screw chuck, D, and longitudinally sliding mandrel, E, substantially as and for the purpose shown and described.

76,221.—MOLD FOR ARTIFICIAL TEETH.—John A. McClellaad, Louisville, Ky.

I claim, 1st, A dental plate mold, formed in sections within a metal flask, substantially as described.

2d, A metal clamp flask, A, for said sectional dental plate mold, constructed and operating substantially as herein described.

3d, The method of forming a dental plate of plastic material, within the said sectional mold, substantially as herein described.

76,222.—GAS FIXTURE.—Emory McClintock, New Brunswick, N. J.

I claim, as a new article of manufacture, a revolving gas bracket for illuminating gas, constructed as described, in such a manner that when the bracket stands in one or more particular positions, the gas will flow through it, but when turned in all other positions the flow of gas will be cut off, as herein shown and described.

76,223.—TREATING CINDER FOR FIXING FURNACES.—Hugh McDonald, Allegheny, Pa.

I claim subjecting melted cinder, slag, dross, or recrement of iron, and of furnaces used in the manufacture of iron and steel, to an active current of air, substantially as herein described, and for the purpose set forth.

76,224.—DOOR AND PACKAGE HOLDER.—John K. McDonald, Newark, N. J.

I claim the combination of the piece, B, hooks, D E, and G, with the loop, A, substantially as and for the purpose specified.

76,225.—COMPOUND FOR MAKING PICTURES TRANSPARENT.—S. D. McPherson, Normal, Ill.

I claim the within-described ingredients, compounded and used substantially as and for the purpose set forth.

76,226.—MACHINE FOR DRESSING CHAIR SEATS.—Henry Meyer, Grafton, Wis.

I claim the guides, E F, the latter provided with the concave upper edge, whereby, as the carriage, G, is reciprocated, a rising and falling motion is imparted to it, by which the depression in the chair seat is cut, all arranged and operating as described.

76,227.—WOOD PAVEMENT.—Alexander Miller, and Carlile Mason, Chicago, Ill.

We claim a pavement, constructed of wedge-shaped blocks, A, when laid so as to break joints with those on the opposite rows, in combination with a concrete filling, and in farther combination with a continuous wood foundation, and so laid as to form continuous rows across the street.

76,228.—ATTACHING CROSS CUT SAWS TO THEIR HANDLES.—Warren P. Miller, New York city.

I claim the collars, c c, pins, d, fitting in notches in saw, and the eccentrics, e e, when constructed, applied, and operating for the purposes as shown and described.

76,229.—PAINT CAN.—David Miller, Allegheny city, Pa.

I claim the combination of the flange, x, and male screw threads, x2, at the mouth of the body of the can, when used in connection with the female screw threads in the flange of the lid, substantially as herein described and for the purpose set forth.

76,230.—PAINT BRUSH.—Joseph W. Moore, Cambridgeport, Mass.

I claim the removable screw top, a, and the handle, C, with a screw thread b, in combination with wedge, B, with its shoulder, c, all constructed and operating substantially and for the purpose described.

76,231.—CULINARY APPARATUS.—Francis Morandi, Malden, Mass.

I claim providing a compound steam-cooking apparatus, such as described with water joints and return tubes, substantially in the manner and for the purpose specified.

76,232.—SHELF BRACKET.—Edward S. Morse, Salem, Mass., assignor to himself and Aaron Goldthwaite, Jr.

I claim, 1st, The method herein described of supporting shelves upon removable brackets, constructed and operating as and for the purpose described.

2d, The combination and arrangement of the bracket, D, upright, C, recess r, and pin, d, in the manner and for the purpose specified.

3d, The combination of the bracket, D, eye, e, and upright, E, in the manner and for the purpose set forth.

76,233.—GLUE CAN.—William Freeman Muchmore, Astoria, N. Y.

I claim a glue can, consisting of the water can, A, from the annular cover, B, of which the glue reservoir, C, is suspended, substantially as herein shown and described.

76,234.—LACING DEVICE.—James Nealey, Jr., Bangor, Me.

I claim, 1st, The hook, B, as a new article of manufacture, when constructed within turning eyes, and the lacing eye closed, substantially as described and shown.

2d, Combining with shoe, C, the lacing hooks, B, when constructed and combined with the shoe, substantially as described and shown.

76,235.—HOE SEED-DROPPER.—Thomas Nevison, Jr., Morgan Ohio.

I claim the sack, I, chamber, D, attached to the hoe handle, A, in combination with the sleeve, E, gage block, F, brush, G, and spring, f, substantially as and for the purpose set forth.

76,236.—MACHINE FOR SHARPENING AND GUMMING SAW.—Abner W. Newhall, Horse Heads, N. Y.

I claim a table for supporting saws in being ground and gummed, constructed with two folding leaves, D D, so adjustably supported by the bifurcated support, E, as to maintain equal angles to the horizontal plane, substantially as and for the purpose set forth.

76,237.—DITCHING MACHINE.—W. A. Nichols, West Liberty, Iowa.

I claim, 1st, The ditching machine, consisting of the forward plow, C, attached to the beam, B, the cutting disks, D1, in front of said plow, in line with its point, the rear plow, C', having cutters, a, and secured to the beam, E, bearing the cutting disk, D2, and attached to the forward beam by the clevis and link, all constructed and arranged to operate as herein shown and described.

2d, The rear plow, C', when provided with the vertical cutters, a, for shaping the sides of the ditch, as herein shown and described.

3d, The arrangement of the forward cutting disks, D D1, with relation to the forward plow, C, as described, whereby the earth at the sides and center of the ditch is cut, to enable the plow to throw the dirt equally upon each side, as herein set forth.

76,238.—BAND FOR BALING COTTON.—Henry W. Oliver, Jr., Pittsburg, Pa.

I claim the band, A, bent around the head of the bolt, B, as indicated at x, said band being used in combination with the bolt, B, and nut, C, constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

76,239.—LAMP CHIMNEY.—William Onions, and Henry Roberts, St. Louis, Mo.

We claim the elastic band, C, attached to the lower part of the upper metallic portion, B, of the lamp chimney, and extending down below the same, to fit into the upper end of the glass portion, A, of the chimney, substantially in the manner as and for the purpose set forth.

76,240.—HOISTING APPARATUS.—Charles R. Otis, Yonkers, N. Y. Antenated March 25, 1868.

I claim, 1st, So combining the drum, B, with the steam valve and friction brake, that when released from the tension of the suspending rope, it shall automatically cut off the steam from the engine, and tighten the brake against the wheel, substantially as herein set forth.

2d, The studs, f f*, and spring, g, in combination with the band wheel, a, and drum, B, whereby the drum is moved in advance of the band wheel when released from the tension of the suspending rope, substantially as herein set forth.

3d, The cam-faced annular slide, a*, furnished with an arm, d, connected with the drum, B, in combination with the cam-faced enlargement, b, of the shaft, A, and the sliding rod, c, whereby the turning of the aforesaid slide is caused to operate the valve in the supply pipe, A*, substantially as herein set forth.

4th, The rod, m*, and lever, m, so combined with the valve in the supply pipe, A*, and the loaded lever, D, of the friction brake, that the said brake shall be held away from the friction wheel, b, when the valve is opened, substantially as herein set forth.

76,241.—WHEEL-BARROW.—Francis Parkerson, Philadelphia, Pa.

I claim a wheel-barrow, composed of the above-described parts, all arranged, constructed, and operating in the manner above set forth and shown.

76,242.—ROCK DRILL.—Joseph Peevy, Orono, Me.

I claim, 1st, The adjustable and notched collars, n n', in combination with the drill shank, m, and the bifurcated and notched shaft, k, as and for the purpose set forth.

2d, The spring arm, k, in combination with the walking beam, A, and the drill rod, as and for the purpose set forth.

76,243.—PLOW.—Mathias Penning, Leavenworth city, Kansas.

I claim the combination and arrangement of the colter, A, having a horizontal extension, B, bolted to the land side, the rod, E, eye bolt, n, eye plate, c, clip, b, upright, d, plow handle, G, and plow beam, H, all constructed and operating substantially as and for the purpose shown and described.

76,244.—COMPOUND FABRIC FOR COVERING WALLS, ETC.—John M. Perkins, Plainfield, N. J.

I claim, 1st, A compound fabric, composed either of laminæ of wood and paper, or laminæ of wood and paper pulp, or laminæ of wood and some textile material, for covering and decorating walls or furniture, prepared, employed, and preserved from injury while being handled or transported, in the manner and for the purposes herein set forth.

2d, Preserving thin laminæ of wood, or any compound thereof, from liability to injury, and securing ease and freedom in unrolling the same, by forming the rolls in such a manner that the grain of the wood shall run in the direction of and around the roll, substantially as described.

76,245.—VARNISH FOR THE SURFACE OF ROLLS USED IN TEXTILE MACHINERY.—David Phetteplace, Lewiston, Maine.

I claim the described compound, consisting of the ingredients, substantially as set forth.

76,246.—CLAMP FOR HOLDING PALM-LEAF WARP.—Cyrus Powers, Greenwich Village, Mass.

I claim the removable clamp for holding palm-leaf warp, constructed as described, consisting of the grooved piece, B, and tongued piece, A, hinged together at a, and provided with the notches and catches, c, as herein shown and described.

76,247.—NUT-CRACKER.—E. L. Pratt, Boston, Mass.

I claim, in combination with jointed jaws, a b, the lever, d, jointed to one jaw, b, and hung upon a swinging fulcrum, substantially as described.

Also, connecting the lever to the jaw, a, by the curved link or links, e substantially as and for the purpose set forth.

76,248.—LIMB AND BASKET HOLDER.—Wm. Richardson, Baltimore, Md.

I claim the instrument above described, consisting of the staff, A, fixed hook, H, sliding hook, H, and the knob, a, or its equivalent, all the parts being constructed and arranged substantially in the manner and for the purpose specified.

76,249.—WAGON WHEEL.—P. R. Ridgely, Iron Mountain, Mo.

I claim the rib, b, when combined with the spoke, B, and felly, C, in the manner herein shown and for the purpose set forth.

76,250.—SHINGLE MACHINE.—Daniel W. Roche (assignor to himself and J. P. Roche), Rochester, N. Y. Antedated Feb. 25, 1868.

I claim the screw, l, revolving nut, n, and hand-wheel, o, geared to said nut, all arranged and operating in connection with the movements of the carriage, substantially as and for the purpose herein specified.

76,251.—GATE.—Elias Roth, New Oxford, Pa.

I claim, 1st, The combination of the pivoted lever, E, and connecting-rod or bar, G, with the gate, A, substantially as herein shown and described, for the purpose of opening and closing the gate.

2d, The combination of the rope, H, swiveled pulley, I, two or more ropes or wires, K, and pivoted pulleys, L, with each other and with the lever, E, and posts, F and M, or equivalent supports, substantially as herein shown and described, and for the purpose set forth.

76,252.—CURTAIN FIXTURE.—Lewis J. Schaefer, Philadelphia, Pa.

I claim the combination of the rod, C, with its projections, a a', or their equivalent, and the spring, D, so arranged that the adjustment of the fixture is effected by turning the said projections between the coils of the spring, substantially as herein specified.

76,253.—MIRROR.—Samuel R. Scottron, Springfield, Mass.

I claim, 1st, An arrangement of mirrors, b c, in frames, d e f, and set into wings, C and D, hinged together, substantially as and for the purpose shown.

2d, The combination of the above with the rod, B, having the shoulder, a, and set-nut, E, and arranged in a stand, A, so as to be adjustable in hight, substantially as shown.

76,254.—ANIMAL TETHER.—Jonathan Scribner, Franklin, N. H.

I claim the forked and curved pole, C, with weights, D, in combination with cross-bar, B, and standard, A, substantially as described.

76,255.—HARVESTER.—Antony Shebanck, Cleveland, O.

I claim, 1st, The drum, K, placed loosely on the axle, C, and provided with the internal teeth, j, the pinion, L, connected with the fixed plate, M, and the pinion, N, attached to the bevel-wheel, H, placed loosely on the axle, C, all arranged in connection with the clutch, O, for the purpose of driving or operating the sickle, Y, substantially as and for the purpose set forth.

2d, The collar, c, provided with the circular disks, D, having two flanges d d, in combination with the right-angular flanged hub, e, and pawls, F F, whose guide-rods, g, surrounded by spiral springs, operate upon each side of the axle, C, all constructed, arranged, and operating as herein described for the purpose specified.

3d, The rod, T, applied to the finger-bar, P, and rod, S, as shown, and connected with the bent lever, U, arranged relatively with the lever, V, to operate in the manner substantially as and for the purpose set forth.

76,256.—PROCESS FOR STEELIFYING IRON.—Thomas Shehan, Dunkirk, N. Y.

I claim, 1st, The combination of the ingredients composing the charcoal compound, substantially as and for the purpose set forth.

2d, The combination of the charcoal compound with the broken limestone, substantially as and for the purpose described.

3d, The employment of a perforated plate, when used as and for the purpose specified.

76,257.—SALIVA PUMP.—A. M. Shurtleff, Boston, Mass.

I claim combining with the saliva vessel or chamber, a device for attaching it to a chair or other surface, substantially as described.

Also, in combination with the vessel, a, and its flexible pipes and mouthpiece and pump-bulb, the let-off pipe, r, substantially as described.

Also, combining with pipes, s and b, and vessel, a, the reversible bulb, c, or reversible valves, for drawing the saliva into vessel, a, or for expelling it therefrom, substantially as set forth.

Also, covering an elastic pump bulb with a close woven or equivalent covering, substantially as shown and described.

76,258.—BEE HIVE.—A. J. Smith, and H. C. Reed, Decorah, Iowa.

We claim the combination of the queen trap and cage with the hive, substantially as described for the purpose specified.

76,259.—RUNNERS FOR UMBRELLAS.—O. M. Smith (assignor to S. W. Evans and A. Agnew), Philadelphia, Pa.

I claim a runner or notch, consisting of a tube, A, and a bent plate or ring, a', constructed and secured to the tube, substantially as described.

76,260.—MILK STIRRER.—J. H. Soule, Georgetown, N. Y.

I claim, 1st, The stirrer, I, constructed as described, resting upon the milk to be stirred, and operated by means of the arm, H, from the beam, A, having the weight, B, and bucket, C, said stirer being allowed to rise and fall with the milk in the vat, as herein shown and described.

2d, The combination of one or more buckets, C, and stop chain or chains, F, or their equivalents, with the pivoted beam, A, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of one or more spring catches, G, with the end or ends of the pivoted beam, A substantially as herein shown and described and for the purpose set forth.

76,261.—WINDMILL.—A. H. Southwick, Oskaloosa, Iowa.

I claim the arrangement of the platforms, B C, and wheel, E, with the shutters, G G, connected together by the fastenings, q q, and rods, H H, and combined with a governor, substantially as and for the purposes set forth.

76,262.—HEEL PROTECTOR.—A. H. Southwick, Oskaloosa, Iowa.

I claim the metallic rim, d, for attaching to and around the entire under surface of the heel, when said rim is provided with the curved and beveled flange, A, to extend up the side of the heel and keep the same level, as and for the purposes described.

76,263.—FORMER FOR HOOP SKIRTS.—Alfred R. Stanley, Boston, Mass.

I claim combining the skirt former fram with its standard, by a turning and sliding join, and counterpoising mechanism, substantially as and for the purpose specified.

Also, in combination with the skirt former frame, the series of adjustable clamps, or equivalents therefor, substantially as and for the purpose specified.

76,264.—STEAM WATER ELEVATOR.—C. L. Stevens (assignor to himself and A. A. Denton), Galesburg, Ill.

I claim the construction of a wooden air-tight tank, strengthened and supported with the iron bolts, battens, and wooden casings, substantially in the manner and for the purpose as herein set forth.

76,265.—COMPOUND RUBBER ENAMELLED CLOTH FOR BOOTS and Shoes.—Edgar M. Stevens, Chelsea, Mass., assignor to himself and W. N. Ely, Trustees.

I claim, 1st, The use of the compound rubber enamel cloth as described, in the manufacture of boots and shoes.

2d, As articles of manufacture, boots and shoes made, as to their uppers, of the compound rubber enamel cloth, substantially as described.

76,266.—MODE OF TREATING MALT AND OTHER LIQUIDS.—G. Storey, Wheeling, W. Va. Antedated March 20, 1868.

I claim the process of treating malt liquors and the fermented extracts of cereals by freezing, substantially as herein described.

76,267.—ARTIFICIAL LEG.—A. Strasser, Montgomery, Ala.

I claim the combination of the frames, E F, hinged together with the stop joint, G, the sliding frame, H, having arms, I, engaging with the notches, O, of the frame, E, the cross bar, K, stem, J, spiral spring, N, strap, L, and adjustable eye-bolt, T, all constructed and arranged to operate as herein described for the purpose specified.

76,268.—PISTON.—Wager Swayne, United States Army.

I claim a piston, constructed substantially as described, so as to operate automatically during nearly the whole movement of the piston by its motor, to discharge water against the inner surface of the cylinder on the exhaust side of the piston, for the purposes specified.

76,269.—DROPPING PLATFORM FOR HARVESTERS.—C. R. Taber and J. Oscar Taber, Salem, Ohio.

We claim, 1st, A vibrating or swinging dropper composed of slats supported at their rear ends only, in combination with the ledge or rebate upon the finger bar, substantially as described.

2d, A slatted dropper suspended upon single vibrating arm at its inner end substantially as described.

3d, The combination of the vibrating dropper with the single standard or support of the overhung reel, substantially as described.

4th, The links or arms, e e, in which the reel shaft has its bearing, by means of which the reel is adjusted upon its single standard or support, as described.

76,270.—MACHINE FOR MAKING PAPER PULP.—J. Taggart, Roxbury, assignor to himself and J. A. Bacon, Bedford, Mass.

I claim the combination of the male and female cylinders or frusta, and the helical threads thereof, arranged on them so that that or those of one cylinder or frustum shall be pitched in a direction opposite to that or those of the other, as specified, the same being for use in manner and for the purpose substantially as hereinbefore set forth.

Also, the reducing cylinders or frusta, made with helical threads, arranged with opposite pitches, as described, and as having teeth formed on the upper part of either or each cylinder or frustum, as set forth.

Also, the application of the shaft of the inner of the two frusta, made as described, to the driving pinion and bearing of such shaft as to enable the frustum to rise within its follow under circumstances substantially as set forth.

And, in combination with the reducing frusta, so made with helical threads arranged to pitch in opposite directions, as set forth, means, substantially as described, or its equivalent, for supporting the inner frustum, and adjusting it in altitude, as specified.

Also, the arrangement or combination of the two frusta, made as described, with a tank or tub, substantially in manner as set forth, whereby the contents, reduced in a liquid, when in the tub, and the inner frustum may be in

revolution, are made to flow radially and vertically with respect to the outer frustum, as specified, such causing the pulp, in passing into the reducing frustum, to converge toward a common center, and, in passing out of such frustum, to diverge from the frustum tangentially, or thereabouts, whereby the pulp will be mixed to great advantage.

76,271.—MANUFACTURE OF SPHERICAL SHOT AND SHELL.—John Blake Tarr, Fair Haven, Mass.

I claim, 1st, A combination of mechanical devices, substantially such and operating essentially so, as that hereinbefore described, for compressing and forming spherical shot, while in a plastic state from heat.

2d, In a machine such as is hereinbefore described, giving the outer edges of the retaining and forming dies an additional flare, in the manner and for the purpose above set forth.

3d, In combination with a pair of concave dies, arranged to compress or form spherical bodies of heated metal, as above described, mechanism for imparting to each of said dies a different motion from that given to the other substantially as and for the purpose above described.

4th, In a machine for forming spherical bodies from heated metal, in the manner above shown, the construction and use of a stop gage, constructed substantially as described, in combination with compressing and forming dies.

76,272.—MEDICAL COMPOUND.—C. K. Tayntor, Cuyler, N. Y.

I claim a medical compound, composed of the ingredients herein set forth and for the purposes described.

76,273.—CURTAIN FIXTURES FOR CARRIAGES, ETC.—Charles E. Thompson, New Haven, Conn.

I claim the combination of the metal socket, a, and india rubber tube, b, with the binding lever, c B, and the springs, d and B, when they are constructed, arranged and fitted for use, substantially as herein described and set forth.

76,274.—WATER METER OR MOTOR.—Chester Turner, Grand Rapids, Mich.

I claim, 1st, The pivoted wings, H H', adapted to operate both as valves and pistons, substantially as herein described and represented.

2d, The combination of the shell or casing, A B, packing, I, ports, F G, rotory hub, E, having chambers or apartments, E1 E1', and openings, E2 E3, with the valves or wings, H H', all constructed and arranged to operate in the manner and for the purpose set forth.

76,275.—SUB-SOIL PLOW.—S. D. Tuttle, Eaton, Ohio.

I claim, 1st, The screw clip, C, furnished with the thumb screw, c, substantially as and for the purpose set forth.

2d, The brace, T, in combination with said subsoil attachment, as and for the purpose described.

4th, The weeding attachment, E, substantially as and for the purpose set forth.

5th, The combination of the lever or rod, n, with the guide, N, as and for the purpose specified.

6th, The clip, C, subsoil attachment, S, brace, T, handles, B B, weeding attachment, E, rod or lever, n, and guide, N, the whole being constructed and arranged substantially in the manner and for the purpose set forth.

76,276.—ROOFING COMPOUND.—Wm. B. Valentine, Buffalo, N. Y.

I claim a roof composed of materials combined and applied in the manner herein described.

76,277.—COCK FOR GAS BURNER.—Samuel B. H. Vance (assignor to Mitchell, Vance and Co.), New York city.

I claim the gas burner cock having the round edge port or passage, c, constructed around about two thirds of the circumference of the plug, substantially as shown and described, and for the purpose specified.

76,278.—AUGER.—A. C. Vaughan, Philadelphia, Pa.

I claim the metal tube, A, with its external screw thread, b, extending to the lower end of the tube, when the latter, with the screw thread, is cut away, to form the cutting edges, l l1 l2, and when the outer edge of the screw thread is on a line with or nearly on a line with the outer cutting edge, l, for the purpose described.

76,279.—PORTABLE ROCK DRILLING MACHINE.—Wm. Weiler, Washington, N. J.

I claim, 1st, The drill rod, L, operated by a sliding weight, H, and raised and partially turned between each of the blows of the weight by the antifraction rollers, f, and dogs, g, of the endless bands, d and d', through the medium of the levers and devices herein described, or their equivalents, all substantially as and for the purpose specified.

2d, The drill rod, L, secured to the frame of the machine by plates, k and l, in such a manner as to be readily detached from the same, as described.

3d, The sliding weight, H, and its spring catch, l, elevated by the plates, e, of the endless bands, d and d', and released by the pin, j', of the adjustable plate, k, in the manner and for the purpose specified.

76,280.—STEAM BOILER FURNACE.—James D. Whelpley and Jacob J. Storer, Boston, Mass.

I claim, 1st, The inclined jambs, m, and fire brick arch, I, arranged within the fire box, to secure an axial focus of radiation within the fire box, substantially as described.

2d, The arrangement of inclined jambs in the fire box, and concave radiating surfaces, substantially as described.

3d, The arrangement of the surrounding masonry flues of the setting surrounding the boiler, with concave interior surfaces towards the boiler, so curved that the axis of the radiation may fall within the water space of the boiler as a linear focus, as and for the purpose described.

4th, In the employment of pulverized fuel for heating purposes, the arrangement of a blast of carbon and air above the fire, introducing the air-floated coal among radiating surfaces, together with a blast of less power below the grate bars, to maintain the combustion of the lump coal, and prevent fusing the grate bars, as and for the purpose described.

76,281.—WASHING MACHINE.—Levi H. Whitney, Washington, D. C.

I claim a washing machine combining in its construction the following elements, viz: A boiler, A, and steampipe, D, a case, E, with perforated partitions, F and G, an oscillating frame, M, with arms, M', said frame being attached diagonally to the shaft, L, and receiving motion from the arm, I', and bevel wheels, I and K, and the balls, N, said several parts being arranged substantially as described.

76,282.—CORN PLANTER.—Thomas H. Wible, Quincy, Ill.

I claim a hand planter, constructed and arranged substantially in the manner described, so as to deposit four grains of corn or other seed in one hill, each in a separate hole, and at fixed distances from each other, by one positive motion, as herein specified.

76,283.—PLOW CARRIAGE.—Geo. F. Willey, Laconia, N. H.

I claim the construction of the carriage, A A A, with the plow, P, and attachments, combined and adjusted as shown in the drawings.

76,284.—GILL NET.—Daniel Wills, Camden, N. J.

I claim the application of a series of open frames or rings to the meshes of the bottom of the net, substantially as described for the purpose specified.

76,285.—REFRIGERATING CAR.—Geo. K. Wood, Morristown, N. J.

I claim the pillar, Hx, arranged or placed within the provision chamber, any or all of them communicating above and below the dead air space, between said chambers and the sides of the car, substantially as and for the purpose set forth.

76,286.—PACKING FOR JOINTS.—J. E. Wootten, Reading, Pa.

I claim a packing compound of felt or other suitable fibrous material, prepared in the manner and for the purpose specified.

76,287.—PAPER FILE.—Edmund W. Woodruff and George C. Green, Washington, D. C.

We claim, 1st, The clamp lever, D, provided with the lugs, F F G G, or their equivalents, combined with the base board, A, substantially as described, so that no portion of said clamping device shall project below the lower surface of said base board when the apparatus is in operative condition.

2d, The clamp lever, D, or its equivalent, and the file board, E, combined and arranged so that the pressure derived from the elasticity of the paper shall always be applied to the upper end of said lever, substantially as set forth and to the effect described.

3d, Making the file board, E, or its equivalent, separate from and independent of the clamping device, for the purpose set forth.

4th, The plate, C, or its equivalent, extending lengthwise through the central portion, but not to the edges of the base board, A, substantially as described, in combination with the clamping device, so that the side pieces, B B, may be applied without interfering with the operation of said clamping device.

76,288.—SCUFFLE HOE AND GARDEN TRIMMER.—Isaac Pardee (assignor to himself and Arial C. Cotton), Vineland, N. J.

I claim the combination of the angular plate, A, arms, B B, and piece, C, substantially as shown and described and for the purpose specified, and that whether with the slot, c, or a series of holes as described, in its stead, and whether with or without the radial serrations mentioned.

76,289.—ANIMAL TRAP.—William L. Starr, Columbus, Ohio.

I claim the substitution, in a box trap, A, of a single wire coil, E, retained by a yielding connection, a, and having its two ends free and pointing inward, one to hold and release the revolving platform, and the other for the bait, in place of the ordinary pivoted lever, and all operating together substantially as herein described.

76,290.—FARE BOX FOR PASSENGER CARS.—James E. Woodruff, Buffalo, N. Y.

I claim a box to receive passenger fare, in combination with a revolving cylinder, or its equivalent, under control of the driver, to act as a cover to said box, so that the fares may be put in without any opening of the box.

76,291.—HOOP SKIRT.—Alfred R. Stanley, Boston, Mass.

I claim the method of manufacturing hoop skirts herein described, that is to say, uniting the ends of the wires by means of the lock clasps herein described, and inclosing said clasps in the pockets of the tapes, or equivalent covering, all while on the "former," substantially as set forth.

Also, as a new manufacture, a hoop skirt with the ends of the wires united together by the lock clasps herein described, and said clasps inclosed in the pockets of the tapes, or the equivalent thereof, all substantially as herein described.

76,292.—COOKING STOVE TANK.—Gurdon G. Wolfe, Troy, N. Y.

I claim, 1st, The reservoir or water tank, A, constructed with an upper bottom, F', and a lower bottom, A', and intermediate plate, K, and exit flue, E, each being arranged and combined in the manner and for the purposes substantially as herein described and set forth.

2d, The combination of the reservoir or water tank, A, constructed substantially as herein described, with a cooking stove, having a part or portion of the rear end of the top removed, substantially as shown at fig. 2 of the accompanying drawings, so as to receive and contain the upper part or bottom, F', of said reservoir, in the manner and for the purposes substantially as herein described and set forth.

3d, The employment of the damper, C', in the upper part of the rear and vertical end plate of the cooking stove, in combination with the vertical flues in the rear end of the stove, and with that part or portion of said reservoir extending below the top plate of said cooking stove, as seen at fig. 1 of accompanying drawings, and in the manner and for the purposes substantially as herein described and set forth.

4th, The employment of the flue-opening, L, flue-plate, L', and flue chamber, M, in combination with the reservoir, A, in the manner substantially as herein described and set forth.

5th, The employment and arrangement of a reservoir or water tank with a cooking stove, so that a part thereof shall be above the top plate of the stove, and over the vertical flue or flues in the rear end thereof, and a part below such top plate, in the manner substantially as shown at fig. 1 of the accompanying drawings.

76,293.—MANUFACTURE OF HARD RUBBER.—William Mullee, Chesterville, assignor to Mosely Ezekiel, Philadelphia, Pa.

I claim the above-described process of producing a prime article of hard rubber, by combining rubber and sulphur, as above described, and treating them substantially in the manner above set forth.

REISSUES.

2,903.—DUSTING BRUSH.—J. O. Adams, and E. A. Warfield (assignees of Robert H. Aldrich,) Northampton, Mass. Patented March 12, 1867.

We claim a brush made of sheepskin, with the wool on, cut into strips, and fastened over one or more central cores, substantially as herein shown.

2,904.—MACHINE FOR ROLLING, SHAPING, AND FORGING FILE BLANKS, FILES, AND OTHER METALLIC ARTICLES OF SMALL DIMENSIONS.—David Blake, Waterford, N. Y., assignee of James Dodge. Patented May 1, 1866.

I claim, 1st, The combination of a rolling apparatus, having an intermittent movement, in combination with a swaging apparatus, all constructed substantially as described, and so used alternately that a piece of metal will, as the mean effect of the rolling and swaging operations, be fashioned into shape substantially in the manner hereinbefore set forth.

2d, Governing the rotation of the rollers, so as to stop and start such rotation at any desired time or position, by the means described, or by other mechanical equivalents.

3d, The combination and use of the wedges and springs, constructed and arranged as described, for regulating the distance of the rollers.

2,905.—HARVESTER.—John A. Dodge, Auburn, N. Y. Patented June 26, 1866.

I claim, 1st, The frame, A, attached to the platform, and arranged to support the rake and beater arms, substantially as set forth.

2d, The combination, substantially as set forth, of a continuously revolving crown wheel, carrying rake and reel arms, with the frame or standard, A, for the purpose described.

3d, The combination, substantially as set forth, of the cam, D', and bed piece, B, with the frame, A, these parts being constructed and arranged for joint operation as set forth.

4th, Pivoting the rake and reel arms to the crown wheel, L, by means of the cross heads or bars, b, fitting into suitable cavities in the wheel, L, and held in place by the plate, O, substantially as shown and described.

5th, The combination, substantially as set forth, of the detent plate, E, and ratchet plate, E', with the sprocket wheel, D, chain, M, and pulley, C, for the purpose set forth.

6th, The combination, substantially as described, of the bracket, I, socket, I', and overhanging arm, H, for the purpose set forth.

7th, The combination, substantially as described, with the overhanging arm, H, of the chain, P, and arm, G, to support the inner end of the platform.

2,906.—MECHANISM FOR BOOT AND SHOE SEWING-MACHINE.—W. N. Ely, Stratford, Conn., assignee by mesne assignments, of Francis D. Ballou. Patented January 22, 1861.

I claim, 1st, The foot piece, C, when constructed and arranged and used as a guard, or guard and gage, substantially as and for the purposes described.

2d, The lip or standard, c, when constructed, arranged, and used as a guard or gage, or support for the shoe, substantially as described.

3d, The combination of a guide or guard, substantially as described, with an opener for opening the channel for the action of the needle, substantially as set forth.

4th, The presser, D, in combination with the adjustable foot pieces, C and C', substantially as described.

5th, The bearing plate, B, and lip or standard, c, in combination with the presser bar, substantially as described.

6th, The projecting perpendicular plate, B, with standard, c, substantially as and for the purposes described.

7th, The combination of the bearing plate or table, E, with the lip or standard, c, substantially as described.

8th, The combination of the standard, c, with the foot piece, C, arranged substantially as described, and for the purposes set forth.

9th, The supporting, guarding, or guiding, and channel opening mechanism, when combined and arranged in relation to each other, substantially as and for the purposes set forth.

10th, The projecting horizontal table plate, A, provided at its outer edge with a projecting standard, c, and arranged so that an opening is formed between the two for the needle, substantially as and for the purposes described.

2,907.—WATCH.—S. D. Engle, Hazleton, Pa. Patented April, 24, 1866.

I claim, 1st, The employment of a box or supplemental case, B, to receive the movement of a watch, secured in the external or principal case of the watch, by means of studs or pins and a groove, for the purpose herein set forth.

2,908.—EYE-GLASS.—Charles Parker, Meriden, Conn., assignee of George N. Cummings, Providence, R. I. Patented July 30, 1867.

I claim, 1st, The continuous spring, B, combined with the two glasses, A A, when attached and secured to each of the bows, at or near the point, D, in the manner substantially as herein set forth.

2d, The arrangement of the guides, E E, upon each of the bows, and so as to wholly or partially surround the spring, at a point above the point, D, and and so as to leave the spring free in the said guides, substantially as and for the purpose specified.

2,909.—CULTIVATOR.—John S. Rowell, and Ira Rowell, Beaver Dam, Wis. Patented July 3, 1866.

We claim the combination of the slotted beam, A, shank, B, brace bar, C, and bolt, D, when the parts are constructed and arranged to operate as and for the purposes herein specified.

DESIGNS.

2,961.—TOBACCO BOX.—George M. Bull, New Baltimore, N. Y.

2,962.—CONTAINER OF WATER CLOSET.—William S. Carr, New York city.

2,963.—STOVE DOOR.—Daniel S. Colby, and Robert Scorer (assignors to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,964.—LEG AND DOOR OF A STOVE.—Daniel S. Colby, and Robert Scorer (assignors to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,965.—STOVE URN.—Daniel S. Colby, and Robert Scorer assignors to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,966.—KEY SOCKET.—Louis Hildebrand, Philadelphia, Pa.

2,967.—TRADE MARK.—Joseph C. Hoagland, Ft. Wayne, Ind.

2,968.—CLOCK FRONT.—Elias Ingraham, Bristol, Conn.

2,969.—CLOCK CASE FRONT.—Elias Ingraham, Bristol, Conn.

2,970.—STOVE.—Frederick Leibrandt, and William L. Mcdowell, Philadelphia, Pa.

2,971.—COOK'S STOVE.—John Martino, Jacob Beesley, and John Currie, Philadelphia, Pa. Antedated February 11, 1868.

2,972.—TRADE MARK.—Sylvester S. Marvin, Pittsburg, Pa.

2,973.—FURNACE DOOR.—A. H. Mershon, Philadelphia, Pa.

2,974 and 2,975.—FLOOR CLOTH PATTERN.—Charles T. Myer, Bergen, N. J., assignor to Edward C. Sampson.

2,976.—CLOCK CASE FRONT.—Carl Muller, New York city.

2,977 and 2,978.—CLOCK CASE FRONT.—George B. Owen, Winsted, Conn.

2,979 and 2,980.—ALPHABET OF LETTERS.—William H. Page, Norwich, Conn., assignor to W. H. Page & Co.

2,981 and 2,982.—PRINTER'S BORDER.—Wm. H. Page, Norwich, Conn., assignor to W. H. Page & Co.

2,983.—GROUP OF FIGURES.—John Rogers, New York city.

2,984.—DOOR OF A STOVE.—John R. Rose, and Edward C. Caley (assignors to Cox, Whiteman & Cox), Philadelphia, Pa.

2,985.—COOK'S STOVE.—Garrettson Smith, and Henry Brown assignors to William Flesh and J. J. Roeper), Philadelphia, Pa.

2,986.—COOK'S STOVE.—Garrettson Smith, and Henry Brown (assignors to Smith, Johnson & Co.), Philadelphia, Pa. Antedated Feb. 25, 1868.

2,987.—SHOW CASE MOLDING.—Philip Sum, New York city.

2,988.—PLATE OF A STOVE.—Nicholas S. Vedder (assignor to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,989.—DOOR AND LEG OF A COOK'S STOVE.—Nicholas S. Vedder (assignor to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,990.—COOK'S STOVE.—Nicholas S. Vedder, and Francis Ritchie, Troy, N. Y., assignors to William Resor & Co., Cincinnati, Ohio.

2,991.—STOVE DOOR.—Thomas Walker (assignor to Edward J. Hicks, and Gurdon G. Wolfe), Troy, N. Y.

2,992.—SPOON OR FORK HANDLE.—Le Roy S. White, Waterbury, Conn.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., *37 Park Row, N. Y.*

[ISSUED FOR WEEK ENDING MONDAY, MARCH 23, 1868.]

47,812.—DRILL BIT.—Horace F. Love, Windsor, Vt., assignee of William W. Grier, and Robert H. Boyd, Fulton, Pa. Dated May 23, 1865. Application for reissue received and filed February 29, 1868.

I claim, 1st, The notch, constituted, constructed, arranged, and disposed substantially as described.

2d, The reamers, constituted, constructed, arranged and disposed substantially as and for the purpose set forth.

71,466.—BRICK MACHINE.—Helmuth Dueberg, New York city. Dated November 26, 1867. Application for reissue received and filed March 11, 1868.

I claim, 1st, The within-described process of forming bricks by machinery, by exposing the clay to two subsequent operations, viz., forcing it through a forming die, so as to produce a bar of clay from which the roughly shaped bricks are cut off, and then pressing over these roughly shaped bricks, in suitable molds, substantially as set forth.

2d, The arrangement of one or more forming dies, F F', extending from the spout, E, in combination with a corresponding number of molds, I I', substantially as and for the purpose described.

3d, The feeder, c, in combination with the plungers, J J', operating substantially as set forth.

4th, The combination of one or more stationary press boxes, G G', and plungers, J J', with a movable table containing the molds, substantially as and for the purpose set forth.

5th, The recess, h, in the press boxes, to allow the surplus clay to escape, as set forth.

6th, The arrangement of a pair of molds, the followers of which are connected by a rocking lever, M, or its equivalent, for a mutual discharge of the bricks, as described.

7th, The pieces of flannel, n, or other absorbent material, supplied with oil from cups, m, in combination with the followers, L L', constructed and operating substantially as and for the purpose set forth.

61,431.—SEED PLANTER.—D. S. Holman, Conneautville, Pa. Dated January 22, 1867. Application for reissue received and filed March 14, 1868.

I claim, 1st, The revolving axle, C, and the clutch, b b', all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The two seed slides, H H, placed one above the other, at the upper part of the tubes, G, and having springs, d, bearing against them, in combination with the wheels, I, and projections, e, having pins, f g, in their peripheries, all arranged to operate substantially in the manner as and for the purpose forth.

3d, The regulating slide, J, in combination with the seed slides, H H', arranged substantially as and for the purpose specified.

4th, The combination of the metallic tubes, L, and covering shares, O, all arranged and applied so as to be capable of operating and being adjusted, substantially as shown and described.

5th, The seed slides, H H', tubes, G, springs, d, wheels, I, projections, e, with the pins, f g, in combination with the slides, J, metallic tubes, L, and the covering shares, O, all arranged to operate in the manner substantially as and for the purpose specified.

35,899.—MODE OF FASTENING DOOR KNOBS TO THEIR SPINDLES.—Darius Skidmore, Seneca Falls, N. Y. Dated July 15, 1862. Reissue No. 2,475. Dated February 5, 1867. Application for reissue received and filed March 14, 1868.

I claim covering or inclosing the end of the coupling device of the knob shank and spindle, wholly or partially by the socket or sleeve of the rose, substantially as and for the purpose herein specified.

41,701.—METALLIC SHANK FOR BOOTS AND SHOES.—Edward Heaton, New Haven, Conn. Dated February 23, 1864. Application for reissue received and filed March 16, 1868.

I claim, 1st, A boot or shoe shank, composed of two strips united, the one being of a flexible but not necessary elastic material, and the other of an elastic material, substantially as and for the purposes herein shown and described.

2d, The combination of a tempered and untempered spring, in the manner and for the purposes shown and set forth.

3d, The combination with a boot and shoe shank of otherwise ordinary or suitable construction and material, of a spring united with the said shank, so as to bear upon the same at both ends thereof, substantially in the manner herein shown and specified.

35,355.—MEANS OF ATTACHING INDIA RUBBER TO PENCILS.—William C. Vosburgh, and William A. Ludden (assignors to John J. Merritt), Brooklyn, N. Y. Dated May 20, 1862. Application for reissue received and filed March 16, 1868.

We claim, 1st, The construction and use of separate casing, in combination with a rubber eraser, c, adapted to be applied to either end of a pencil, or pen handle, without necessity for previous preparation, and to allow the ready application and removal of the same, substantially as and for the purpose herein specified.

2d, We claim the within-described construction of the said casing, to wit: the two semi-cylindrical clamps, b b, formed as specified, and the ring or rings, G, in combination with the section of india-rubber, c, and the pencil or pen handle, a, as and for the purposes herein set forth.

36,538.—BIT BRACE.—G. Stackpole, New York city, and J. N. Winslow, Portland, Me., assignees of G. Stackpole. Dated September 25, 1862. Application for reissue received and filed March 17, 1868.

I claim, 1st, In combination with a divided bit, shank socket, having a contracted neck, A', as specified, the ring, E, for holding said bearing upon the shank, substantially as set forth.

2d, I claim forming the socket of a bit brace, with bit shank grooves, m m, of different depths, as and for the purpose set forth.

3d, I claim so forming the bearings, C C', that the lesser grooves therein may be made to receive more than one sized bit shank, without an enlargement of the grooves to the extent of the whole length of the socket or the bit shank, substantially as specified.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

599.—ELECTRICAL SIGNAL OR ALARM.—George W. Shawk and Job Franz, Cleveand, Ohio. Feb. 22, 1868.

611.—ILLUMINATING GAS.—Charles M. Tainton, New York city. Feb. 24, 1868.

621.—HOOP SKIRT.—Thomas B. De Forest, Birmingham, Conn. Feb. 25, 1868.

647.—ELECTRO-MAGNETIC APPARATUS.—Laban C. Stuart, Mamaroneck, N. Y. Feb. 26, 1868.

650.—WASHING MACHINE.—James Turner, Robert Turner, Archibald Turner, M. C. Turner, T. C. Turner, and G. M. Turner, New York city. Feb. 26, 1868.

664.—CONSTRUCTION OF BOATS OR VESSELS.—Elisha Waters, George T. Balch, Clarence W. Waters, and George A. Waters, Troy, N. Y. Feb. 27, 1868.

685.—DRYING AND FINISHING FELTED GOODS AND FABRICS.—John H. Prentice, Brooklyn, N. Y. Feb. 28, 1868.

818.—TREATMENT OF FIBROUS MATERIALS, AND MEANS FOR RENDERING THE SAME FIRE AND WATER PROOF.—Robert O. Lowrey, Salem, N. Y. March 9, 1868.

EXTENSION NOTICES.

James Bragley, administrator, and Mary Pitts, administratrix, of the estate of John A. Pitts, deceased, of Buffalo, N. Y., having petitioned for the extension of a patent granted to the said John A. Pitts the 4th day of July, 1854, for an improvement in horse power, for seven years from the expiration of said patent, which takes place on the 4th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of June next.

Warren Shaw and Parley G. Green, of Wales, Mass., having petitioned for the extension of a patent granted to them the 20th day of June, 1854, for an improvement in tentering cloth, for seven years from the expiration of said patent, which takes place on the 20th day of June, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 8th day of June next.

Edward Lindner, of New York city, having petitioned for the extension of a patent granted to him the 27th day of June, 1854, and reissued in two divisions Dec. 23, 1856, and numbered respectively 415 and 416, for an improvement in magazine, repeating, and needle guns, for seven years from the expiraton of said patent, which takes place on the 27th day of June, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of June next.

John Taggart, of Boston, Mass., having petitioned for the extension of a patent granted to him the 4th day of July, 1854, for an improvement in machines for excavating earth, for seven years from the expiration of said patent, which takes place on the 4th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of June next.

Horace Smith and D. B. Wesson, of Springfield, Mass., having petitioned for the extension of a patent granted to them the 14th day of February, 1854, and reissued the 10th day of October, 1854, this application having been authorized by act of Congress, for an improvement in fire-arms, for seven years from the expiration of said patent, which took place on the 14th day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

George Hand Smith, of Rochester, N. Y., having petitioned for the extension of a patent granted to him the 18th day of July, 1854, and reissued in two divisions the 14th day of August, 1856, and numbered respectively 2,233 and 2,234, for an improvement in process of making steel direct from the ore, for seven years from the expiration of said patent, which takes place on the 18th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

Advertisements.

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*

Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

IMPORTANT TO PLUMBERS, GAS FITTERS MANUFACTURERS, AND OTHERS.—The Abbott Pipe Coupling Co., are now prepared to furnish Plumbing Materials of every description, with Patent Attachment for connecting lead pipe of any size or thickness, without heating an iron, or the use of solder. These connections can be made by an ordinary mechanic in from two to five minutes, without a helper. They have been in use, under the highest pressure, with both hot and cold water, for eighteen months, and we can warrant them as tight and as lasting as the pipe itself. For Price list, Shop, or State Rights to manufacture, apply to the

ABBOTT PIPE COUPLING CO.,
1* No. 5 Murray street, New York.

Agents Wanted.

FOR THE LIFE OF GEN. U. S. GRANT, By Hon. Henry C. Deming. The only work of the kind issued under the sanction and by the authority of Grant himself. The author is well known as one of the most brilliant writers and eloquent orators in the country. Agents will find this one of the most intensely interesting Biographies ever published in America, and will meet with a ready sale. For particulars, address

S. S. SCRANTON & CO., 126 Asylum st., Hartford, Ct.
16 4

PLATINUM. H. M. Raynor, 748 Broadway, N. Y.

FOREMAN AND MOLDER WANTED. Address STEARNS, CLARK & CO., Erie, Pa. 16 3

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.
16 4

SHAPER, 6½ in. STROKE. GEAR CUTter, cuts 4-ft. dia., and 6-horse Steam Engine and Boiler, for sale by L. DUVINAGE, 580 Hudson st., N. Y.

TWO BOILERS FOR SALE—42-in. diameter, 22 feet long, connected, with all fittings, made by one of our best makers. Address V. PUIG, Nos. 40 and 42 Broadway, room 53.

LIVINGSTON & CO., Iron Founders, Pittsburgh, Pa.
Fine Light CASTINGS All Kinds.
Either Grey or Malleable Iron. 16 2

300 HORSE-POWER BOILER FOR Sale cheaper than the same will ever again be built. Warranted smaller, lighter, safer, and more durable, and guaranteed to save one-half fuel used in other Boilers. VAN ZANDT BROS., 56 Wall st.

TERRITORY FOR SALE. We offer great inducements to persons in our Patent Excelsior Self Ventilating Blacksmith Tweer. We offer our Patent Right on the most reasonable terms. For further particulars apply to LAIRD & HEIGLY, Mechanicsburgh, Pa.
16 2*

A FAITHFUL and DISCREET PERSON of either sex, a long resident and good writer, to undertake an important commission in every town. $25 to $50 can be made without trouble. Address

JAMES WYATT,
S. E. cor. Broadway and Fulton st., N. Y. city.

THE ADVERTISER, Having had long experience in the construction and operation of Machinery, and the management of Workmen, wishes to engage to superintend some establishment where his experience may become available. Would prefer to go South. Satisfactory city reference. Address Manager, Box 1470, P.O.

SCREW-BOLT CUTTERS.—Schwirtzer's Patent Bolt Cutters, with an equal amount of power and labor, will cut twice as many bolts as any other machine in use. For sale by the

SCHWIRTZER PATENT BOLT CO.,
Green Point, Brooklyn, E. D., N. Y.

PATENT NOW OUT.—Roth's Improvement for operating Gates from team or saddle, may be attached to any gate for two dollars. May be opened and closed by one cord by a child six years old. Will not get disarranged by sagging of gate nor frost raising the posts. See claim in to-day's paper. Great inducements to agents. E. ROTH, Patentee, New Oxford, Pa.

SEAL PRESSES.—J. R. PERKINS, Detroit, Mich., has invented a new process of puting perfect solid Counters in Seal Presses at the time of pouring the metal, in less than one minute, without heating the seal, and at no expense except for metal. For samples and circulars address as above.

Counters made by this process are on exhibition at the office of the STAFFORD M'F'G CO.,
1* No. 66 Fulton st., New York.

A WATCH FOR $1. THE MAGNETIC Time Indicator and Compass, in a neat case, with glass shade, steel and German Silver works, white enamelled dial, ordinary watch size, sound and serviceable. Warranted to denote correct time, and keep in order for two years. Where satisfaction is not given, the money will be returned. Sent, postpaid, for $1; three for $2; or by express, C.O.D., on receipt of $1 as a guarantee. Address HUNTER & CO., Hinsdale, N. H. 16 3

For Sale Below Cost.

FIFTEEN PORTABLE STEAM ENGINES, Different Sizes; 8 Portable Flour Mills; 6 Lane's Patent Circular Saw Mills; 1 Muley Saw Mill, Anderson's Patent, and other Machinery. Send for printed description to Washington Iron Works, Newburgh, N. Y., or to WARD & STANTON,
57 Liberty st., New York.

Orders for Steam Engines, Boilers, and general machinery solicited. 16 4

THE GRAND COMBINATION.—The United States Hay and Cotton Press. Its success fully established and all Presses now before the public pronounced the best in the world. Responsible manufacturing firms and capitalists can now make liberal arrangements with the proprietor for introducing them in all sections of the country. The merits and cheapness of the Press enables them to be sold rapidly and more readily than any others. For circulars and particulars address JAS. H. BIGGS,

Dyer, Lake Co., Ind., or Box 2239, Cincinnati, Ohio.

Special Notice.

IMPORTANT Improvements, Secured by Letters Patent, negotiated. Capital procured for solvent Reliable Inventors, Manufacturers, and Incorporated Co's. Address E. TIFFANY & CO., 4 Wall st., N. Y.

REFERENCES:—E. Tiffany & Co. are a straightforward and reliable firm.—E. D. Tiffany, Pres't First National Bank, Hartford, Conn.; H. W. Slocum, Director M.U.Ex. Co., 365 Broadway; R. J. Capron, of Scott, Capron & Co., Bankers, 58 B'd'y; Stephen Crowell, Pres't Phenix Insurance Co., 129 B'd'y, New York. 1*

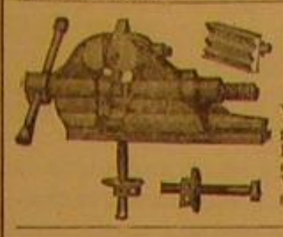
A NEW CLASS IN PRACTICAL PHRENOLOGY is forming. For circular, with full particulars, address, with stamp "Phrenological Journal, New York. 14 4

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line Improved Lathes for making large valves, etc. Address Exeter Machine Works, Exeter, N. H. 13 tf

GREAT ECONOMY IN

WATER POWER.

LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet for 1868 sent free on application. 12 4os* 16 4is*



UNION
VISE CO.,
OF BOSTON, MASS.,
Make
VISES of all KINDS, for very heavy or light work. Pipe Vises, with or without extra jaw. Wood-worker's Vises. Vises with covered screws. Send for price list.
15 3

Cheap, Useful, AND Elegant.

IMPROVED BRONZE ALUMINUM HUNTING CASED WATCHES,

(the qualities and resemblance of this new metal are such, compared to Gold, that even judges are deceived), and ROSKOPF'S PATENTED PEOPLE'S WATCH.

The Improved Bronze Aluminum of which my watches are made, is a metal differing entirely from any ever offered to the public. It has seriously occupied the attention of scientific men, and has not only called forth the eulogium of the press, in consequence of its peculiar properties, but has also obtained a Gold Medal at the Paris Exposition and even been favorably noticed by rescript of his holiness, Pius IX., authorizing its use in the manufacturing of church goods.

The qualities of this metal are such that it is surpassed by none, if we except gold itself, and that only on account of the intrinsic value of the latter. Further details will be found in my circular, which will be sent, postpaid, on demand.

My Watches are of three sizes, all hunting cases, one small for Ladies or Lads, and two for Gents. The movements are well finished, and perfectly regulated. I can, therefore, warrant them excellent time-keepers. These goods being manufactured in my own factory, I am enabled to sell any of the above sizes at the extremely low price of $16.

A full assortment of all kinds of Coins always on hand.

Goods sent by Express, C. O. D., with charges.

Not responsible for money sent inclosed in letters. Address JULES D. HUGUENIN VUILLEMIN,
tf] No. 44 Nassau Street, New York.

FRENCH BURR MILLSTONES, BOLTING CLOTHS,
Of the very best qualities imported,
Supplied Cheaper than any other house in the country by
GEO. TALLCOT,
14 13* 96 Liberty street, New York.

FUEL Economized and Power Increased by Carvalho's Pat. Steam Super-Heater, easily attached to boilers, gives perfectly DRY steam, remedies "priming." Address H. W. BULKLEY, Gen'l Ag't, 70 Broadway, N.Y.
9 13*

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip Saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse, 107 Liberty st., New York. 13tf

WOODWORTH PLANERS A SPECIALTY—From new patterns of the most approved style and workmanship. Wood-working Machinery generally. Nos. 24 and 26 Central, corner Union street, Worcester, Mass.
15 tf WITHERBY, RUGG & RICHARDSON.

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents.
12 tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

WIRE ROPE.

Manufactured by
JOHN A. ROEBLING
Trenton, N. J.

FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 10 13*tf

IRON & WOOD WORKING MACHINERY

TURBINE WATER-WHEELS.
LUCIUS W. POND,
85 LIBERTY ST. N.Y. and Worcester, Mass.
15 tf

ROOMS AND POWER TO LET FOR Manufacturing purposes at low rates. Apply at the Washington Iron Works, Newburgh, N. Y., or at New York city office, 57 Liberty st. 13 4*

ASHCROFT'S LOW WATER DETECTor will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York. 12 12*

Cheap Guns, Revolvers,

ETC., FOR THE PEOPLE.

Double-barrel Shot Guns, warranted wrought iron..$9 00
" " " " " steel twist.....16 00
Boys' single do " " " wrought iron.. 3 50
Men " " " " imitation twist, 4 50
Smooth-bore muskets, brass mounted, good as new warranted to shoot shot close and kill at 60 y'ds.. 2 00
Pocket revolvers, 5-shooters for powder and ball, new 9 00
" " 6 " and 100 metal cartridges, 10 00

Water-proof caps 20c per 100. Patch cutters 50c. Liberal discount to dealers or clubs. Cash paid for Spencer's, Henry's, and Sharp's Rifles, and Colt's Army or Navy Revolvers. Remit money by postal order or registered letters. Agents wanted in every city and town in the U. S. to sell three useful articles. Used by every body. Send stamp for circulars, etc. Address J. H. JOHNSTON, Great Western Gun Works, 179 Smithfield st.,
10os 11s Pittsburgh, Pa.

Pressure Blowers

PRESSURE BLOWERS—Of all Sizes, for purposes where a blast is required. For particulars and circulars, address B. F. STURTEVANT,
15 13 No. 72 Sudbury st., Boston, Mass.

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21*

CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, Instruction, Reports, etc., on the useful arts. 1 tf

Springfield Brass Foundery, E Stebbins' Manufact'ng Co., Spring'd, Mass., furnish to order every variety of brass and composition castings, car boxes, letters, Babbitt metal, etc., of superior quality. Sample castings can be seen and orders left at Hayden, Gere & Co.'s, 84 Beekman st., N.Y., and Dalton & Ingersoll's, 17 & 19 Union st., Boston.
8 13*

STEAM ENGINES and BOILERS, Steam Pumps, Engine Lathes, Planers, Shaping Machines, Brass Finisher's Tools, and Machinists' Tools of all kinds. Also, Grist Mills, Cotton Gins, Saw Mills, Wheel and Hub Machines, Shingle Machines, and Wood Working Machinery of all kinds at JOHN F. C. RIDER'S,
47 Dey st., New York.
Manufactory at South Newmarket, N. H. 1 16

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies.
12 12*] JOHN ASHCROFT, 50 John st., New York.

BABCOCK & WILCOX'S PATENT STATIONARY STEAM ENGINES,
From 25 to 1,000 horse-power, built in the best manner and at the shortest notice by the
South Brooklyn Steam Engine & Boiler Works
Imlay, Summit, and Van Brunt sts., Brooklyn, N. Y.
☞ Over 4,000 horse-power of these engines are now running and contracted for.
10 8* D. McLEOD, Proprietor.

BEST PLANERS & WOOD TOOLS as formerly, by E. C. TAINTER, Successor to J. A. FAY & CO., Worcester, Mass. 8 tf

BOILER FELTING SAVES TWENTY-five per cent of Fuel. JOHN ASHCROFT,
12 12*] 50 John st., New York.

PORTABLE STEAM ENGINES, COMbining the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Adress
J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's Supplies, of all kinds, at
1 24* M. T. DAVIDSON & CO.'S, 84 John st., N. Y.

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 12 12*

WHEELER & WILSON, 625 BROADway, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1 1f*

POWER PUNCHES AND SHEARS, Straightening Machines, Vertical Drills, etc. Address GREENLEAF & CO. Indianapolis Ind 7 tf

PHOENIX IRON WORKS—
Established 1834.
GEO. S. LINCOLN & CO.,
Iron Founders and Manufacturers of Machinists and Gun Tools, 54 to 60 Arch street, Hartford, Conn.
Samples may be seen in our Wareroom. 14 tf

SMALL STEAM ENGINES, From 2 1-2 to 8 Horse-Power, manufactured and in store. For sale by JOHN F. C. RIDER,
South Newmarket, N. H., or 47 Dey st., New York. 1 16

YOU CAN SOLDER your own tin ware without a soldering iron by buying one bottle of Wilson's Prepared Solder. Samples sent on receipt of 25 cents, with price list. Agents wanted everywhere. Direct to WILSON & CO., 19 Lindall st., Boston. 11 tf-D

$25 CAPITAL ONLY IS REQUIRED to commence the very profitable business of Stencil Cutting. Tools and Stock of the best quality, and all necessary information furnished by M. J. METCALF & SON, 101 Union st., Boston, Mass. 15 2

FARMER'S THERMO-ELECTRIC BATTERY, W. H. Remington, Manufacturer and Agent. Manufactory at Cohasset, Mass. Office and salesroom, No. 109 Court street, Boston, Mass.

This Battery does away entirely with acids, quicksilver, or liquids of any kind, the electrical current being generated by the action of heat, a simple gas burner being all that is required to put this battery into action. It is clean, constant, and requires no care, performing the work of any acid battery. 14 tf

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes.
1 12tf] M. & T. SAULT COMPANY, New Haven, Conn.

PATENT SHINGLE, STAVE, AND Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and Heading Jointers, Heading Rounders and Planers, Equalizing and Cut-off Saws. Send for Illustrated List.
FULLER & FORD,
5 tf] and 284 Madison street, Chicago Ill.

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail.
BENEDICT BROS., Jewelers, 171 Broadway.
BENEDICT BROS., up town, 691 Broadway.
BENEDICT BROS., Brooklyn, 234 Fulton st. 1 tf

WROUGHT-Iron Pipe for Steam, Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y.
12 12*

SOLID EMERY WHEELS, all Sizes. GOODNOW & WIGHTMAN, 23 Cornhill, Boston.
12 tf eow

IMPORTANT.—MOST VALUABLE MAchine for planing, irregular and straight work, in wood, is the Variety Molding and Planing Machine, for all branches of wood working. Our improved guards make it safe to operate. Combination collars for cutters save one hundred per cent. For planing, molding, and cutting irregular forms, the machine is unsurpassed.

We hear there are manufacturers infringing on our eight patents on this machine. We caution the public against purchasing such.

All communications must be addressed to COMBINATION MOLDING AND PLANING MACHINE CO., P. O. Box 3,230, New York city.

Our machines we warrant. Send for descriptive pamphlet. Agents solicited. 6 7eow*

VERY IMPORTANT.

THE WHOLE FOUNDATION OF THE OLD VARIETY MOLDING MACHINE, built at New York, is the GEAR PATENT, extended Sept. 30, 1867. The C. M. and P. Machine Company own ONLY A VERY LITTLE OF THE PATENT, outside of the State of New York. The owners, and Attorneys for owners, of the GEAR PATENT, and *sole* manufacturers of the best improved machines made for planing and molding straight and irregular forms in wood, perfectly safe to operate, with improved Feed Table, and improved adjustable collars for combination cutters, saveing 100 per cent; for all the rest of the United States are

A. S. GEAR, JOHN GEAR & CO.,
New Haven, Conn., and Concord, N. H.
☞ *We Warrant our Machines, and Caution the Public to Buy Machines of Lawful Owners* ONLY.
☞ Send for a Descriptive Pamphlet. 10 eow

HYDRAULIC PRESSES, STATIONary and Portable for Pressing Powder, Fish, Oil Boots, Tallow, Linseed, etc. Send for a circular to
2 eow13*] E. LYON, 470 Grand street, New York.

MOLDING CUTTERS Made to Order.—Send for circular to WM. H. BROWN, 44 Exchange st., Worcester, Mass. 1 eow10*

MASON'S PATENT FRICTION CLUTCHES, for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by VOLNEY W. MASON,
5 mthly] Providence, R. I.

MACHINERY.—S. C. HILLS, No. 12 Platt street, New York, dealer in all kinds of Machinery, and Machinists' supplies. 4 tf d

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

SHAW'S "PARAGON"

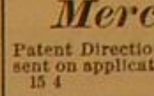
LATHE TOOL

Is a tough Steel Stock, arranged for interchangeable Cutters, made of Diamond Cast Steel. See illustration in Scientific American of April 4th. Each cutter is shaped and tempered, and merely requires grinding, thus saving all dressing at the forge, and time in waiting. The Thread Cutters are milled to the proper angle, which is maintained until it is used up. Each tool will save its cost in men's time in a few days, and frequently in 24 hours of steady work. After a trial no one will be without them. Size No. 1, is ⅝x1¼, price $3, complete. Extra cutters 25 cents. Manufactured by Patentee,

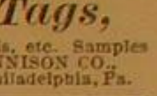
PHILIP S. JUSTICE,
No. 42 Cliff st., New York. No. 14 N. 5th st., Philadelphia.
16 4

ENGINE LATHES—A Specialty.—Send for circular. HARRINGTON & HASKINS,
16 4 Cor. 15th st. and Penn. ave. Philadelphia.

SLIDE LATHES, Iron Planers, Upright Drills, Bolt Cutters, Compound Planers, Universal Chucks, Gear Cutters, etc., at reduced prices. Address
15 13 CHAS. H. SMITH, 125 North 3d st., Philadelphia.



ALBRECHT, RIEKES & SCHMIDT.



MANUFACTURERS OF 1ST-CLASS PIANO FORTES,
No. 610 Arch street,
15 13 Philadelphia, Pa.

Merchandise Tags,

Patent Direction Labels, Shipping Cards, etc. Samples sent on application. DENNISON CO.,
15 4 56 South Third st., Philadelphia, Pa.

KENSINGTON IRON WORKS.—Stationary and Portable Engines of any required size made to order. Also, Locomotive, Fine, Cylinder, and Marine Boilers. Tug Boats and Propeller Yachts of any required length, breadth of beam, and Power.
15 8 A. L. ARCHAMBAULT, Philadelphia, Pa.

C. WEST MYERS, STEAM ENGINE Builder and dealer in new and second-hand Steam Engines, Boilers, Lathes, Planers, and other machinery, No. 245 North Front street, Philadelphia, Pa. Reliable references throughout the United States. 14 4

FIRE-PROOF CONSTRUCTION.—Gilbert's Corrugated "Iron Ceiling," for fire-proof buildings. Office No. 429 Walnut street, Philadelphia. Wrought Iron Beams of all sizes. All kinds of Corrugated Iron. Fire-proof Buildings constructed.
14 13 JOS. GILBERT, Superintendent.

MERRICK & SONS,
Southwark Foundery,

PHILADELPHIA, PA.,

Sole Manufacturers, in Philadelphia, of William Wright's Patent

VARIABLE CUT-OFF STEAM ENGINE,

Regulated by the Governor. Sole Manufacturers in the United States of Weston's Patent

Self-Centering Centrifugal Sugar-Draining Machine.

Bartol's Patent

WROUGHT IRON RETORT LIDS.

Brinckmann's Patent

STEAM HAMMERS,

without valves. Address
MERRICK & SONS,
6 eow C*] 430 Washington Ave., Philadelphia, Pa.

Cedar Vats, Tanks, and Reservoirs,

For Brewers, Distillers, Dyers, Chemists, Manufacturers etc., Public and Private Buildings, etc., etc.
GEO. J. BURKHARDT & CO.,
8 13*] Buttonwood, below Broad st., Philadelphia, Pa.

Bridesburg Manf'g Co.,

Office No. 65 North Front Street,
PHILADELPHIA, Pa.,
Manufacture all kinds of Cotton and Woolen Machinery including their new

Self-Acting Mules and Looms,

Of the most approved style. Plans drawn and estimates furnished for factories of any size. Shafting and mill gearing made to order. 7 15* tf

Drying Machines

For Print Works, Bleacheries, and Dyeing Establishments. Also, for drying warps and finishing cotton cloths. Faymen & Stearns' Patent Tentering and Drying Machine for woolen goods, ginghams, etc. H. W. BUTTERWORTH, 29 and 31 Haydock st., Philadelphia, Pa. 7 16*

POWER LOOMS. Improved Drop Box

Spooling, Winding, Beaming Dyeing, and Sizing Machines, Self-Acting Wool Scouring Machines, Hydra Extractors. Also, Shafting, Pulleys, and Self-Oiling Adjustable Hangers, manuf'd by THOS WOOD, 2106 Wood st., Phil'a, Pa.
6 13*

OIL! OIL!! OIL!!!

FIRST PREMIUM.....PARIS, 1867

Grand Silver Medal and Diploma!

WORLD'S FAIR—London, 1862.

TWO PRIZE MEDALS AWARDED

PEASE'S IMPROVED OILS!

Engine, Signal, Lard, and Premium Petroleum is the Best Made for

Railroads, Steamers, and for Machinery and Burning.

F. S. PEASE, Oil Manufacturer,
Nos. 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world.
6 tf

STEAM and GAS FITTERS, Also, Plumber's Goods, and Tools of all kinds. Quinn's Patent Boiler Ferrule, the only Sure Remedy for a leaky Tube. Also, Steam Gages, Gage Cocks, Water Gages, safety Valves and Feed Pumps, for sale by
JOHN F. C. RIDER, 47 Dey st. N. Y.
Manufactory at South Newmarket, N. H 25 17

WROUGHT IRON BEAMS & GIRDERS

THE UNION IRON MILLS, Pittsburgh, Pa.—The attention of Engineers and Architects is called to our Improved Wrought-Iron Beams and Girders (Patented), in which the compound welds between the stem and flanges, which have proved so objectionable in the old mode of manufacturing, are entirely avoided, we are prepared to furnish all sizes at terms as favorable as can be obtained elsewhere. For descriptive lithograph address the UNION IRON MILLS,
5 13* Pittsburgh, Pa.

PATENTS

The First Inquiry that presents itself to one who has made any improvement or discovery is: "Can I obtain a Patent?" A *positive* answer can only be had by presenting a complete application for a Patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After a season of great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning.

If the parties consulted are honorable men, the inventor may safely confide his ideas to them: they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, have been actively engaged in the business of obtaining patents for over twenty years—*nearly a quarter of a century*. Over Fifty thousands inventors have had benefit from our counsels. More than one third of all patents granted are obtained by this firm.

Those who have made inventions and desire to consult with us, are cordially invited to do so. We shall be happy to see them in person, at our office, or to advise them by letter. In all cases they may expect from us an *honest opinion*. For such consultations, opinion, and advice, *we make no charge*. A pen-and-ink sketch, and a description of the invention should be sent, together with stamps for return postage. Write plainly, do not use pencil nor pale ink; be brief.

All business committed to our care, and all consultations, are kept by us *secret and strictly confidential*. Address MUNN & CO., 37 Park Row, New York.

For Instructions concerning Foreign Patents, Reissues, Interferences, Hints on Selling Patents, Rules and Proceedings at the Patent Office, the Patent Laws, etc., see our Instruction Book. Sent free by mail on application. Those who receive more than one copy thereof will oblige by presenting them to their friends.

Address all communications to

MUNN & CO.,
No. 37 Park Row, New York City.
Office in Washington, Cor. F and 7th streets.

Advertisements.

A limited number of advertisements will be admitted on this page at the rate of $1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

ASBESTOS

THIS Indestructible Mineral differs from all others in possessing fine silk-like fibers which render it capable of being woven into cloth. It is now manufactured (after being crushed or ground) into a fire and water-proof coating for roofs, which can be applied with a brush, and a cement for joints and fissures in stone, wood and metals, and for repairing leaks in roofs, of all kinds, and around chimneys, dormer windows, etc.

We GUARANTEE these materials to be superior to everything heretofore used for such purposes, the fibers of Asbestos giving them strength and tenacity on the principle of hair in mortar.

ASBESTOS ROOFING, 3½ to 7½ cents per square foot.
ASBESTOS ROOF COATING, 75c. and $1 per gallon.
ASBESTOS CEMENT, in 10-lb. pails, 10c. per lb.

For sale by Hardware and Paint Dealers, and at Drug and general Stores. Descriptive circulars will be furnished to all who are interested in the newly-discovered uses of this wonderful mineral.

H. W. JOHNS, Patentee,
And for ten years manufacturer of Improved Roofing Materials, 78 William st., New York.

"We consider this invention one of great value."—Eds. Scientific American. 15 10s*

P. B. Sheldon's whereabouts, something of interest to him. Address soon N. Mead, Peekskill, N.Y.

TO MANUFACTURERS AND CAPITALISTS.—
Proposals are invited for the patent rights, or an exclusive license to manufacture a new Fire-arm possessing the following advantages:—

It can be carried in the pocket. Does not require a special cartridge. Can be loaded and fired from 20 to 30 times per minute. Carries a half-ounce ball, or will discharge two half-ounce balls at a shot. Is superior in style, finish, simplicity, and efficiency to any pistol ever offered to the public. Apply to E. S. RENWICK,
34 Beach street, New York,
Where a specimen and the patents can be seen. 15 2*os

Band Saws.

FRENCH BAND SAW MACHINES and SAWS—
For Sawing Logs and Reslitting. Also, for Light and Heavy work. G. GUEUTAL,
1*os 39 West Fourth st., New York.

ONE HYDRAULIC PRESS, with pumps, second-hand, for sale. Also, one portable 20-horse Engine, one stationary 2d-hand 30-horse Engine, one 15 horse-power boiler. FRANKLIN IRON WORKS,
15 2*os 76 West Washington st., Chicago, Ill.

NEW AND VALUABLE TOOL.—
Whitney's Combined Center Drill and Countersink, Pat. Feb. 25, 1868. Saves time and labor. Will pay for itself in a day, and last a lifetime, send for a circular.
Address P. A. WHITNEY, Woodstock, Vt.
15 2* os

HOWE'S NEVER FAILING AGUE Cure and TONIC BITTERS. Warranted to cure or no pay. Also, HOWE'S CONCENTRATED SIRUP for blood, liver, skin, CANCERS, etc. Price each $1, or 6 bottles for $5. Address sole proprietor, C. B. HOWE, M.D., Seneca Falls, N.Y.
15 3*os

A PRACTICAL WORKSHOP COMPANION for Tin, Sheet Iron, Copper, and Boiler Plate Workers, Plumbers, etc. Send for a circular.
LEROY J. BLINN,
15 4 44 Woodward Ave., Detroit, Mich.

SPICE CAN AND BLACKING BOX Riveting Machines (Improved), Foot or Power. Send for circulars and sample.
W. PAINTER & CO., Patentees,
15 13 45 Holliday, st., Baltimore.

ANDERSON'S PATENT MULEY SAW Hangings. The oscillating lower Muley and self-adjusting rake upper Muley performs ⅓ more work with ⅓ less power than any other. COE & WILKES, Painesville, Ohio, sole manufacturers, except for the States of Maine and Pennsylvania. Send for circulars. 15 8

A GOOD THING.—HOW TO GET IT.
Would you know what you can do best? What calling or pursuit to follow in life? And how to make the most of yourself? Read the PHRENOLOGICAL JOURNAL. It has a very large circulation, is now in its 47th Vol., and only $3 a year. Or the JOURNAL and SCIENTIFIC AMERICAN for $5. Address S. R. WELLS, or MUNN & CO., New York. 15 4

SULPHUR MANUFACTURERS.—
The Patent of Dr. Sincay, for the Manufacture of Sulphur, patented Oct. 20, 1866, is offered for sale. It is a very valuable invention, and is in extensive use abroad. For further particulars address
ST. PAUL DE SINCAY,
La Vieille Montague, Belgium, care Scientific American office, New York. 15 3

PATENTS INTRODUCED.—A gentleman of 10 years' California experience, returns soon to San Francisco, and will introduce good patents in the Pacific States on favorable terms. Best references given. Address, with particulars, S., Postoffice box 389, Brooklyn, N. Y. 16 1*os

J. KING'S PATENT NON-CUT RINGS for Cylinder Piston Packing. Rights for Shops, Counties, or States, for sale for 66 per cent of the difference of the cost of 1" and Spring or Steam Packing. Address H. J. KING, 47 Hudson st., Hoboken, N. J. 1*os

HALL'S PATENT combined pocket-knife and burglar proof door-button, is meeting with unprecedented sale, and it has been demonstrated that no other knives will sell where these are introduced. Same price as Wostenholm's.

Merchants, agents, peddlers, boys in cars, streets, hotels, steamboats, etc., wanted.

Drummers are making $20 a day obtaining orders.

A beautiful $1 75 pearl knife for $1 25, or a $1 50 shell knife for $1, as sample, sent by mail, postpaid, on receipt of the money.

Send for sample and circular. Address,
A. W. HALL & SON,
Sole Manufacturers,
298 Broadway, N. Y.

TRADE MARK.

NEW METHOD OF Washing Clothes without Labor. The Automatic Clothes Washer and Boiler, Rev. M. W. Staples Inventor and Patentee. This Boiler is self-acting, and dispenses with Labor and the wear of clothes. The hot suds, by the action of heat, is poured upon and forced through the clothes with astonishing rapidity (300 gallons in 20 minutes), cleansing them perfectly without rubbing. It has been thoroughly tested and pronounced unequalled as a Clothes Washer. No. 8 (medium size), fits any stove or range. Price $10. Good Canvassers and Agents wanted for every Town in Eastern and Middle States. A splendid opening for enterprising men. On receipt of price sample Boilers sent to any address. Send stamp for circular.

AUTOMATIC CLOTHES WASHER AND BOILER CO.,
Postoffice Box 6358.
General Agency, No. 19 Cortlandt st., New York.
Also, Sole Agents for
A. FOOTE & SONS,
Owners of Western and Southern States. State and County Rights for sale. 1*os

Brown's U. S. STANDARD SCALES,

of every description.
DAVENPORT & WORTHINGTON, 3 Barclay st., N. Y.
16 os

EMERSON'S PATENT
MOVABLE-TOOTHED
CIRCULAR SAWS
SUPERIOR TO ○ ALL OTHERS.
FOR DESCRIPTIVE PAMPHLET
ADDRESS
AMERICAN SAW Co; N.Y.

EMERSON'S PATENT
PERFORATED
CIRCULAR & LONG SAWS
REQUIRE NO ○ GUMMING.
FOR DESCRIPTIVE PAMPHLET
ADDRESS
AMERICAN SAW Co; N.Y.

Factory, Trenton, N. J. Office, No. 2, Jacob st., N. Y. 14 tt

FREE. Our New Catalogue of Improved STENCIL DIES. More than $200 A MONTH is being made with them S. M. SPENCER & CO., Brattleboro, Vt. 6ostt

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven. 5 os tf

Ready Roofing

READY ROOFING.—The first customer in each place can buy 1000 feet of Roofing at half price—$25. Samples and circulars sent by mail. Ready Roofing Co., 81 Maiden Lane, New York. 12 tf os

14 13* os

Reynolds'

TURBINE
WATER WHEELS
And all kinds of
MILL MACHINERY.
Send for Illustrated Pamphlet.
GEORGE TALLCOT,
96 Liberty st., New York.

WHEATON'S OINTMENT cures the Itch
WHEATON'S OINTMENT will cure Salt Rheum.
WHEATON'S OINTMENT cures Old Sores.
WHEATON'S OINTMENT cures all diseases of the Skin.
Price 50 cents;—by mail 60 cents. All Druggists sell it.
WEEKS & POTTER, Boston, Proprietors. 2 tf os

SAWS. SAWS. SAWS.

Attention, Lumbermen!

HENRY DISSTON, OF PHILADELPHIA,

IS MAKING BOTH INSERTED AND SOLID-TEETH SAWS THAT ARE PREFERRED, BY THOSE WHO USE THEM, ABOVE ALL OTHERS.

☞ For Particulars send to Factory, 67 and 69 Laurel street, Philadelphia, Pa.

BRANCH HOUSE, Lake street, Chicago, Ill. [25 13* eow os

$10 TO $20 A DAY GUARANTEED.

GOOD Agents wanted to introduce our new **Star Shuttle Sewing Machine**—Stitch alike on both sides. The only first-class, low-priced machine in the market. We will consign Machines to responsible parties, and employ Energetic Agents on a Salary. Full particulars and sample work furnished on application. Address W. G. WILSON & CO., Cleveland, Ohio, Boston, Mass., or St. Louis, Mo. 13 6os

STARTLING INVENTION!

LOCKE'S PATENT
SELF LIGHTING GAS BURNER

NO ELECTRICITY. NO FRICTION. NO CHEMICALS.
TURN THE KEY AND THE GAS IS LIGHTED.
Applied to any gas fixture without alteration. Samples sent free on receipt of $1.
BEWARE OF COUNTERFEITS.
Agents wanted everywhere. Liberal discount to the trade.
All communications addressed to
RICHARD B. LOCKE.
Secretary Self-Lighting Gas Burner Co.,
14 3os No. 451 Broome st., New York.

STEAM ENGINES

FROM 4 TO 200 HORSE-POWER—Including LOOMIS' PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONARY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, GRAIN MILLS, etc.
Send for Descriptive Circular and Price List.
WOOD & MANN STEAM ENGINE CO.,
UTICA, N. Y.
Warerooms, 89 Liberty st., near Broadway, N. Y.
10 ostf and 201 and 203 South Water st., Chicago, Ill.

SCALE IN STEAM BOILERS.—
An unobjectionable article for the removal and prevention of incrustations is now offered to the public by
M. A. GLYNN & CO.,
14 4os* Of No. 80 Cedar st., New York.

MODELS, PATTERNS, EXPERIMENTAL, and other Machinery. Models for the Patent Office, built to order by HOLSKE MACHINE CO., Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN office. 14 tf

J. R. ROBINSON, Consulting and Superintending STEAM ENGINEER,
28 State st., Boston, Mass.
☞ Particular attention given to Inspecting and Testing Steam Machinery, as to safety of Boilers, power of Engines, and as to the useful effect of fuel consumed.
14 5*

LATHE CHUCKS—HORTON'S PATENT—from 4 to 36 inches. Also for car wheels. Address, E. HORTON & SON, Windsor Locks, Conn. 4 13*

I AM WILLING TO SELL ENTIRE OR State Rights for the sale and manufacture of my Improved Window Shade Fixture, patented through the Agency of Munn & Co., and illustrated in the Scientific American of June 29, 1867. Agents wanted every where to dispose of Rights and canvas for orders. For particulars apply to the patentee,
14 4 os eow WM. BROWN, Bristol, Conn.

TURNER'S
TIC DOULOUREUX
OR
Universal Neuralgia
PILL.

A SAFE, CERTAIN, AND Speedy Cure FOR NEURALGIA, AND ALL NERVOUS DISEASES.

Its Effects are Magical.

Sent by mail on receipt of price and postage.

One package	$1	Postage	6 cents.
Six packages	5	"	27 cents.
Twelve packages	9	"	48 cents.

It is sold by all wholesale and retail Dealers in Drugs and Medicines throughout the United States, and by
8 26 eow os] TURNER & CO., 120 Tremont st., Boston.

AMERICAN HOUSE, Boston, Mass.
The very important and extensive improvements which have recently been made in this popular Hotel, the largest in New England, enable the proprietors to offer to Tourists, Families, and the Travelling Public, accommodations and conveniences superior to any other Hotel in the city. During the past summer additions have been made of numerous suites of apartments, with bathing rooms, water closets, etc., attached; one of Tufts' magnificent passenger elevators, the best ever constructed, conveys guests to the upper story of the house in one minute; the entries have been newly and richly carpeted, and the entire house thoroughly replenished and refurnished, making it, in all its appointments, equal to any hotel in the country. Telegraph Office, Billiard Halls and Café on the first floor. LEWIS RICE & SON, Proprietors.
8 6* os eow

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. 15 12*

EMPLOYMENT.—$15 to $30 a day guaranteed. Male or Female Agents wanted in every town—descriptive circulars free. Address
15 13—N.] JAMES C. RAND & CO., Biddeford, Me.

FOR STEAM ENGINES, BOILERS, SAW Mills, Cotton Gins, address the ALBERTSON AND DOUGLASS MACHINE CO., New London, Conn. 15 tf

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

THE
HARRISON BOILER

HAS ABSOLUTE SAFETY!
HAS GREAT ECONOMY IN FUEL
HAS DURABILITY AND FACILITY OF REPAIR.

Hundreds of these boilers have now been in use for years, giving perfect satisfaction. For descriptive circular and price apply to

JOHN A. COLEMAN, Agent,
58 Kilby street, Boston, Mass.
J. B. HYDE, Agent,
Office No. 9, at 119 Broadway, New York, or to
THE HARRISON BOILER WORKS,
9 13*] Gray's Ferry Road, Philadelphia, Pa.

WOOD-WORKING MACHINES of all kinds on hand. Also, one Gray & Wood planer, one "Wicks" patent resilting mill, one car mortiser, one tenoning machine, and one flooring machine, at a bargain. Address CHAS. H. SMITH, 135 North 3d st., Philadelphia. 15 3os

Soda Fountains

For sale at No. 302 North 13th st., Philadelphia, Pa., by
14 4os J. C. JOHNSON.

Industrial Works.

MACHINISTS' TOOLS AND EQUIPments for Railroad, Iron Ship Building, and Gun Shops.
STEAM HAMMERS,
TURN TABLES, Shafting, Bolt Cutters, Cotter and Key-Seating Machines, Cranes, Cupolas, etc.
9 13os*] BEMENT & DOUGHERTY, Philadelphia, Pa

DRAWING INSTRUMENTS
OF EVERY DESCRIPTION—
Swiss, German Silver, and Brass Surveying Instruments, Transits, Levels, and Surveyors' Compasses, Surveying Chains, Tripods, Leveling rods, etc., etc. Winser's, and Newton's, and Osborne's Water Colors, Drawing Paper, Faber's Pencils, Standard Rules, etc., etc. A Priced and Illustrated Catalogue sent free on application.
WILLIAM Y McALLISTER, Optician,
11 6os*] 728 Chestnut street, Philadelphia Pa.

DRAWING INSTRUMENTS.—A Manual of 112 pages describing all Mathematical Instruments and Drawing Materials, their use, and how to keep in order. Sent free on application by JAS. W. QUEEN & CO., Mathem'l Inst't makers, 924 Chestnut st., Philadelphia. 11 10*os

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY.
Works, Paterson, N.J.; Warerooms, 4 Dey st., N.Y., Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Rope & Oakum Machinery; Snow's & Judson's Governors; Wright's Patent Variable Cut-off & other Engines. 9 tf

NICHOLSON FILE COMPANY,
Providence, R. I., Sole Manufacturer of the
Patent Increment File.

Circulars, giving prices and explaining peculiarities of manufacture, sent on application. The best testimonials as to the merits of this File can be furnished. 5 13*

D. BALLAUF, MODEL MAKER, No. 414 Seventh street, Washington, D. C.
Orders for Certified Duplicates of Patent Office Models and Original Models for Inventors. 5 13*

THE PEW HAT RACK.—County Rights for Sale. Send for Circular to
14 3* E. S. BLAKE, Pittsburgh, Pa.

1868.

Scientific American.

THE
BEST PAPER IN THE WORLD.
Published for Nearly
A QUARTER OF A CENTURY.

This **Splendid Newspaper**, greatly enlarged and improved, is one of the most reliable, useful, and interesting journals ever published. Every number is **beautifully printed and elegantly illustrated** with several **Original Engravings**, representing New Inventions, Novelties in Mechanics, Agriculture, Chemistry, Photography, Manufactures, Engineering, Science and Art.

Farmers, Mechanics, Inventors, Engineers, Chemists, Manufacturers, people in every profession of life, will find the **SCIENTIFIC AMERICAN** to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the value of which is beyond pecuniary estimate. All patents granted, with the claims, published weekly.

Every Public or Private library should have the work bound and preserved for reference.

The yearly numbers of the **SCIENTIFIC AMERICAN** make a splendid volume of nearly one thousand quarto pages, equivalent to nearly **four thousand ordinary book pages.** A New Volume commences January **1, 1868.** Published Weekly. **Terms:** One Year, **$3**; Half-Year, **$1 50**; Clubs of Ten Copies for One Year, **$25**; Specimen Copies sent gratis.

Address

MUNN & CO.,
37 Park Row, New York.

☞ The Publishers of the **Scientific American**, in connection with the publication of the paper, have acted as **Solicitors of Patents** for **twenty-two years. Thirty Thousand** Applications for Patents have been made through their Agency. More than **One Hundred Thousand Inventors** have sought the counsel of the Proprietors of the **SCIENTIFIC AMERICAN** concerning their inventions. Consultations and advice to inventors, by mail, free. Pamphlets concerning Patent Laws of all Countries, free.

☞ **A Handsome Bound Volume**, containing **150** Mechanical Engravings, and the United States Census by Counties, with Hints and Receipts for Mechanics, mailed on receipt of **25c.**

SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XVIII.—No. 17. [NEW SERIES.] NEW YORK, APRIL 25, 1868. $3 per Annum [IN ADVANCE.]

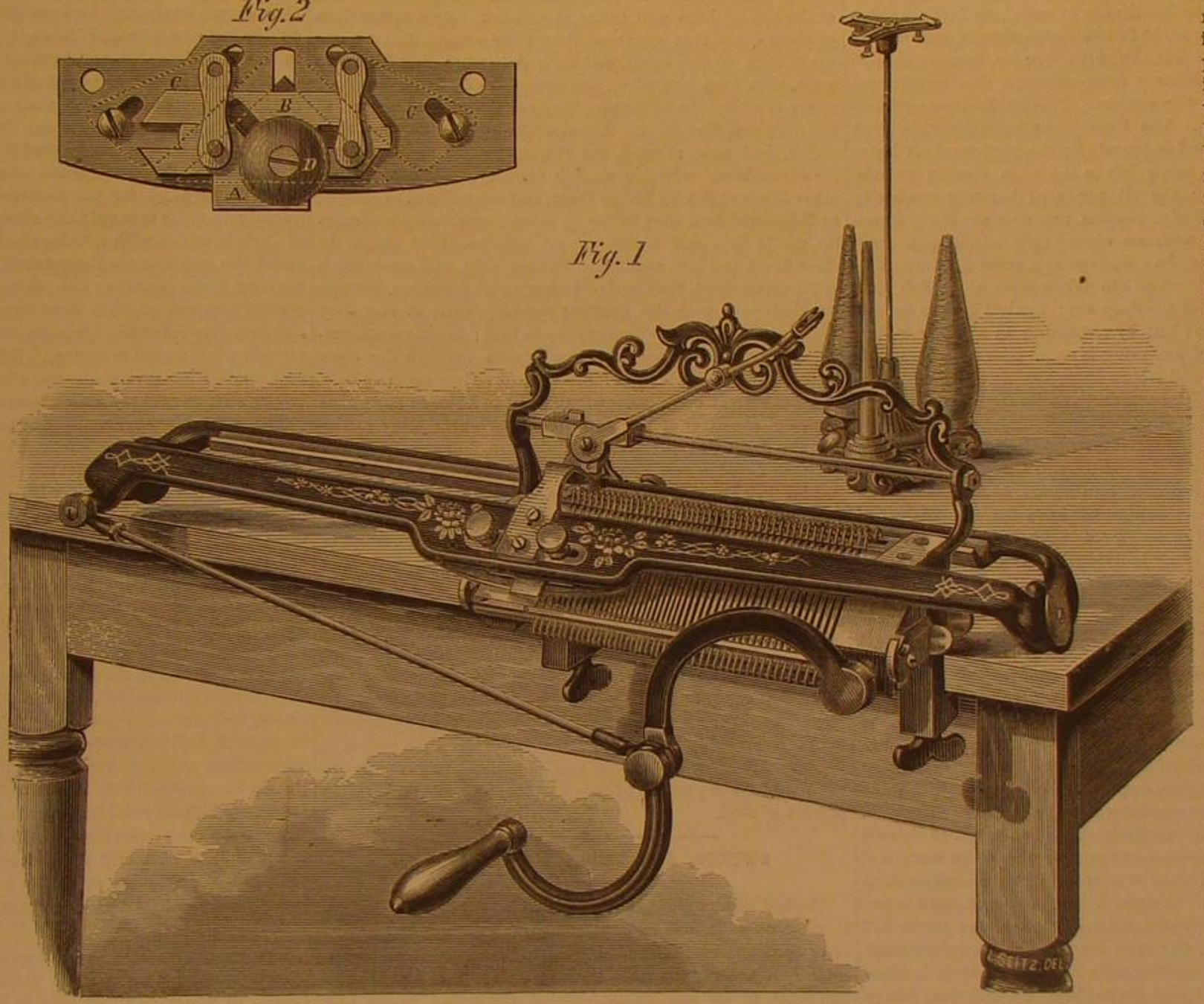
Improvement in Knitting Machines.

The Lamb Knitting Machine, of which the accompanying engraving is a representation, was patented through the Scientific American Patent Agency in December, 1863. Since then valuable improvements have been added, and at the present time it is claimed to be the best family knitting machine that is manufactured.

The invention relates to that class of knitting machines that employ straight rows of needles, in distinction from the class known as circular knitting machines, but more particularly to the simple and novel method of operating two straight parallel rows of needles in such a manner as to produce a tubular web, to widen and narrow with facility, to form a large or small stocking in the same machine, to knit the heels of stockings, and to produce various styles of ornamental and ribbed work in flat web.

Fig. 2

Fig. 1



THE LAMB PATENT KNITTING MACHINE.

The machine may be described in brief as follows: A needle bed or frame (which can be attached to an ordinary table by means of a thumbscrew), having its two upper sides inclined toward each other, their upper edges being separated far enough to allow the fabric produced to pass down between them. Supported by the needle bed is a carriage, reciprocated by means of a crank. Through the arch that passes over the top of the machine is a horizontal rod upon which moves a slide that carries the guide for delivering the yarn into the hooks of the needles-parallel grooves or channels are cut across the bed in which the needles are placed. In these grooves the needles can be moved their entire length, and can thus be brought into operation for widening, or thrown out of operation for narrowing without removing them from the machine.

The needles employed are self-knitting, being constructed in such a manner that when fed by the yarn and carried an inch forward and back, they form the loops by their own action. The lower ends of the needles have an upright shank, extending above the face of the needle bed, and are operated upon by cams that are attached underneath the center of the carriage in such a manner as to move the needles forward and back. There are two sets of these cams, one for each row of needles.

Fig. 2 is a representation of one of the sets of cams, which consists of the plate, A, the two wing cams, C C, and the V-shaped cam, B, which is held in place by the screws that pass through the washer, D, in the diagonal slot of the plate, A. As the carriage to which these cams are attached is drawn back and forth over the needle bed by the crank, the needles are carried up on one side of the V-shaped cam in the groove or space between that and the wing cams, at the same time the yarn guide delivers the yarn into the hooks of the needles, which are then drawn down by the wing cam on the other side of the V-cam, thus forming the loops.

The slide, A, is made to shift, by its lower projection coming in contact with adjustable cam stops that are placed at the ends of the needle bed. In Fig. 2, when the plate comes in contact with the right-hand cam stop, the screw through the washer, D, is forced up the diagonal slot, and brings up the V-shaped cam, thus closing the space between it and the wing cams. When closed the needles pass below the cam without operating. By the adjustment of the cam stops either or both of the cams may be left open or closed at the same time, so as to operate the two rows of needles separately, alternately, or together: thus forming four entirely distinct webs—the tubular web, wide flat web, double flat web, and he ribbed flat web.

As any number of needles can be moved up at the start or be moved up or down at either end of the rows of needles at any time, so any size of web can be set up and any number of loops can be added to or taken from it at will. By thus knitting the fabric either tubular, or flat, single, double, or ribbed, in any desired shape, it will produce every variety of staple and fancy-knit goods.

The loops are formed on precisely the same principle as in hand knitting, but, being of uniform length, render the fabric more elastic and durable.

The proprietors say that in addition to the great capacity and completeness of this machine, it especially commends itself to families for its extreme simplicity, enabling any one to operate it from printed directions. The ordinary speed of the machine is about 5,000 loops per minute, producing a yard of plain work in ten minutes, and a pair of socks complete in half an hour. Although it has been but a short time before the public it has attained a reputation and sale during that time which evinces that the want of such an invention is universally felt.

As the patents of the Lamb Machine cover the principle of crossing two rows of needles so as to form loops on both sides of the fabric; and as it can be worked with far greater speed than other machines—can knit with any number of needles, and widen and narrow at will on both circular and flat webs, (either single, double, or ribbed)—and is capable of producing anything, from a watch cord, infant's stocking, or glove, to a shawl or blanket—its value must be admitted.

All are familiar with what the sewing machine has done in furnishing profitable employment to thousands of laboring women. May not the knitting machine be welcome as a labor-saver, and a source of livelihood for the poor?

Certain it is that between five and six million dollars worth of knit goods are annually imported to this country, and that our markets abound with the raw material of which these goods are fabricated.

These machines are manufactured by the Lamb Knitting Machine Manufacturing Co., of Chicopee Falls, Mass., who will cheerfully furnish to any address any other information respecting the machines, with samples of work.

New Facts in Acoustics.

M. Regnault, of the Institute of France, has been making use of the new sewers of Paris for the purpose of testing, on a large scale, some of the questions in acoustics concerning which there has been much doubt. By firing a pistol in tubes and sewers of various diameters, he found that the sound was carried to the following distances: 1,282 yards in a passage of 4·2 inches diameter; 4191 yards in a passage of 11·8 inches diameter; 10,494 yards in a passage of 43 inches diameter. The nature of the materials and the construction of such passages exercises great influence on the rapidity with which sound is transmitted. In the large Paris sewers, trumpets are used to convey orders to the workmen, and it is found that in those passages whose sides are cemented, the sound is conveyed to a much longer distance than in others whose sides are left as first constructed, with the rough stones only. It is one of the primary principles laid down in text books, that the velocity of the vibrations of sonorous bodies in the same medium is the same for all sounds, grave or sharp, strong or feeble, and whatever may be their pitch, but the researches of M. Regnault would seem to show that this generally received belief is not correct. He asserts that sounds of different pitch are not propagated with equal rapidity but separate from each other on the way.

Acute sounds, also, travel with less swiftness than grave ones; thus, when a baritone sang in very long sewers and at the entrance of water conduits, the key notes were heard at a distance before the harmonics which succeeded it and one another, according to the degree of their altitude. The propagation of sound, consequently, disarranges the harmonics of which it is composed; thus an air embracing a certain extent of the gamut, if heard at a long distance would be seriously altered. This decomposition in tubes may be on account of the friction caused by the sides of the tube or passage way, and cannot be noticed in the open air. The facts propounded by M. Regnault will cause the philosophers to renew their investigations with renewed interest.

LOFODEN NORWEGIAN COD LIVER OIL.

The London *Pharmaceutical Journal* has published a very readable, though somewhat exhaustive article, concerning cod fishing on the Lofoden Islands, the mode of manufacture and other particulars respecting the far-famed Norwegian cod liver oil, much of the information never before having been published. The great length of the article forbids our transferring it entire to our columns, but some extracts will prove of interest.

Every year, early in the month of January, the cod fish begin their great migration from the deep sea. Moving in a northeasterly direction, they approach the coast of Norway and concentrate themselves upon the Lofoden Islands, situated near the northern extremity of Norway, about 150 miles within the Arctic Circle. Immediately on the appearance of the immense shoals of cod at Lofoden, a remarkable result ensues,—all other kinds of fish disappear with one consent. The exact cause of this curious phenomenon is not yet understood, but literally it is the fact that the very herrings used as bait can no longer be taken in those waters, but have to be imported from a distance, and are sold to the fishermen as articles of trade. Two important consequences attend this singular circumstance; one, that the fecundated roe, secure from the predatory attacks of many voracious enemies, has a favorable opportunity for development, whereby a large supply of this valuable fish is maintained; the second, that no other fish than cod can be taken in the nets, and consequent-

ly, no other livers than those of the cod can be employed in the preparation of the oil.

As soon as the cod are known to have arrived, the fishing begins without delay. The total number of men assembled by the first of February is estimated at 25,000. The quantities of cod are prodigious, their numbers incalculable; a good or bad season does not depend on the variable supply of fish,—that is apparently always the same, and beyond computation,—but upon the weather, as every rough day prevents the open boats putting out to sea, and occasions a serious loss to the whole fishery.

Three different methods are employed in the capture or the cod; the deep line, the long line, and nets. Every afternoon, at a given signal from the surveillance, those fishermen having nets or long lines, row out one or two sea miles to their fishing grounds, set their tackle, then row back and pass the night on shore. Next morning, the signal being again given, they all row as before, take their catch, and return with it during the afternoon. The fishermen with deep lines remain all day at sea, leaving very early and returning in the evening. The distance these have to row is from four to seven English miles.

As soon as the fisherman has come to shore, he proceeds to cut the head off every fish and takes out the roe and liver, thus distributing his catch into four groups. The roe he usually salts immediately. The livers are disposed of in the following manner: some he throws at once into large wooden vessels, holding from eight to twelve hogsheads, and, by frequent agitation and stirring with wooden beaters, obtains from them, at the ordinary temperature, a fine transparent oil, which floats on the surface. This oil is drawn off and preserved separately. The livers thus partially exhausted are then either secured in barrels for the purpose of oil burning at home, or else, being left in the open wooden vessels, suffer decomposition; the oil produced becomes gradually darker, bubbles multiply, gaseous products are freely disengaged, accompanied with an exceedingly unpleasant, penetrating smell, that may be perceived at a great distance. The best livers and the finest oil are taken from those fish that have just arrived from the deep sea; the cod is then fattest, and in best condition; but by remaining in shallow water, where the function of spawning is accomplished, where feeding is not its object, and where little food is to be obtained, it becomes leaner and leaner, until, on its return to the deep sea, it is quite emaciated.

Cod fishing at Lofoden terminates on the 14th of April, according to ancient custom, even though the fishing may be productive, with a prospect of continuous good results. The reverence that the northern races have for the festival of Easter is the original cause for this usage, together with the ardent desire felt by every individual to pass the holidays following that religious anniversary, preceding as they do the joyful spring time and much longed for summer, in his own home.

On arriving at their several huts and villages, the preparation of the oil is proceeded with, and generally completed by the end of May. While the barrels of liver remain at Lofoden, and still more during the journey afterwards, much of the cellular tissues becomes disintegrated, and the oil flows out; so soon as the barrels are opened, the oil is carefully poured off and kept apart, and this, together with that made at Lofoden in the open wooden vessels, is the light yellow oil. The livers having been partially exhausted are then thrown into iron kettles hung over an open fire, the water contained by the livers being allowed to evaporate; the oil is poured off as fast as it becomes disengaged by the warmth, and is put into barrels. This is brown oil. Increased heat above 212 Fahr. is now applied; the color deepens; as the temperature increases, the oil gradually grows darker, till at last, when what remains of the livers floats about as hard dark lumps in oil that is almost black, the process is considered to be finished, and the remaining product is the dark tanner's oil.

In Sweden, Denmark, and even in Norway itself, as well as in other places, there is a prejudice in favor of the brown oil. It is regarded by many as superior in its remedial properties to the light yellow oil. But as the light yellow is an exudation at a low temperature from the liver at its freshest period, and has certainly less flavor and odor than any other kind, it does not appear that this preference is well founded.

Fully sensible of the great natural advantages possessed by the Lofoden Islands, Mr. Möller, of Christiania, has been for many years desirous of introducing into general use a superior method of preparing the oil. Manufactories following his suggestions are in operation at Lofoden, Söndmöre, Christiansund and Finmark. The process he recommends may be thus described: The livers are to be treated immediately on their arrival on shore, being less than one day old. The selected ones, all of large size, are washed for the purpose of removing blood, membrane, and all other impurities. They are then introduced into a machine which reduces them into a paste. The paste is then transferred to an apparatus heated externally by steam, and the mass cautiously warmed to 100° or 120° Fahr.; at the same time it is diligently stirred and pressed with large wooden spoons, so that the oil may be liberated at the lowest possible temperature consistent with economical results. As fast as the oil separates, it is withdrawn; and the stearine being first thrown down by exposure to a temperature under 40° Fahr., is filtered; after which it is considered perfect, and may be put forthwith into barrels and bottles. The fresher the liver, and the lower the temperature the clearer, lighter, and sweeter in taste will be the oil. Livers more than one day old require a higher degree of heat.

Three barrels of liver will yield one barrel of the finer oils, and a quarter of a barrel of dark oil; but these proportions are only approximative, for the results will always vary according to the temperature employed in the process. It is never originally brown, but is liable by lying long in wooden casks to acquire a little more color.

The annual produce of cod liver oil by the Lofoden fisheries is estimated at 25,000 barrels, each containing from 24 to 28 English gallons, and that of all the other fisheries on the coast of Norway at about 35,000 barrels more, making a total of 60,000 barrels. During the last two years prices have not been sufficiently remunerative to encourage the preparation of the fine oil on a large scale; only two manufacturers at Lofoden have done so, and one of these, according to the chief of the surveillance, made only ten barrels this year.

The information now incidentally given relating to the propagation of the cod, the deposit of its ova, and the security of the young fry is, though limited, an important addition to our knowledge of the natural habits of the fish; should further observations confirm the opinion held by practical men on the spot, then it will appear that Lofoden is the natural nursery for these immense shoals of cod that swarm the northern seas. Of course, cod ova may be deposited and hatched on many coasts, our own included, but nowhere on the same scale and with the same great results as at Lofodon.

Immense shoals of cod arriving from the deep sea make their annual appearance on the Norwegian coast early in January and continue there to the end of April, when the last of them return. At Newfoundland, shoals of cod arrive at the end of June and retire in October. By a comparison of these dates, it is apparent that their arrival first on one coast, then on the other, and their departure first from one coast, then from the other, are separated by exact intervals of six months. In both cases they come from and return to the deep sea, that is, the Atlantic Ocean. At Lofoden they arrive, and now alleged, for the purpose of spawning; at Newfoundland, certainly as fish of prey. At Lofoden, all other kinds of fish fly before them, and are suffered to escape; at Newfoundland, they follow in fierce pursuit shoals of capelin, cuttle fish, and herrings. At Lofoden, they arrive in their finest and best condition, leaving thin and emaciated; at Newfoundland, they arrive hungry and ravenous, devouring their prey with the greatest voracity, until at last they become gorged and no longer able to feed; in this state, previous to their departure, they can be seen through the clear water to refuse their favorite food held before them as bait. From the great bank of Newfoundland to Lofoden flows that powerful equalizer of temperatures, that warm river in the sea, the great Gulf Stream. In its course, and about midway between Lofoden and Newloundland, is the island of Iceland; cod leaving Lofoden in March to arrive at Newfoundland in June and July, might be expected between these dates to appear on the fishing grounds of this island; they actually do so, the chief cod fishery in Iceland occurring in the spring and summer. Finally, cod approach Lofoden from the southwest; Newfoundland is due southwest of Lofoden.

Weighing these facts, a very interesting and important inquiry presents itself, whether these multitudes of fish, retiring as they do from one and appearing on the opposite side of a great ocean at definite and exact intervals, may not be composed of the same individuals moving in prodigious numbers and probably in detached shoals, urged by a powerful instinct to pursue systematic and periodical migrations—to the East for the purpose of propagation, and to the West in pursuit of food.

SWEETS, AND THEIR MANUFACTURE.

The last thing a child inquires about is how the sugar plum it snaps up with such avidity, is made. Yet the manufacture of these delicacies—we had almost said necessaries—of the nursery is a thing worth witnessing. A marvellous change has come across the public opinion respecting sugar and sweets of all kinds. They used to be denounced by tender mothers as "trash and messes," and possibly because they were so denounced, they tasted all the sweeter to the little ones. Now there is no attempt to taboo that which delighteth the juvenile palate most. In moderation, there is nothiug more wholesome than sugar; and it is, withal, nourishing and warming, in consequence of the large amount of carbon contained in it. Formerly lollypops were not a speciality; there were no large establishments for their production; they were, in fact, one of the miscellaneous items kept in bottles at the pastry cooks. All the higher-class sweets came from France and Italy, where for ages they have been famous for these delicacies. But the introduction of steam into their fabrication has given to England the lead in manufactured sugar articles, which are now made on the largest scale, and are vastly cheapened since the days when we used to spend our halfpence in toffy. The rude style of old is also gone. The eye must now be satisfied as well as the palate, even in the cheapest items. Think of a halfpennyworth of sweets done up in a ruby-colored gelatine packet. There was color, it is true, in some of the more showy sweets of old, but it was metallic color containing the most virulent poison. Doctor Hassall's analysis of this painted confectionery, published in the *Lancet* some years ago, exposed the villanous manner in which this vividly-colored sweetmeat was made attractive to the children by poisonous paint. The brighter the hue the more deadly the sweet. The brilliant green, for instance, with which the toy confectionery was adorned, contained arsenite of copper, as we shall presently show. One can quite understand the bad name sweets acquired when thus made up. There was vermilion in the reds, of course, and gamboge and chromate of lead in the yellows. No doubt many young children were absolutbly killed by plentifully partaking of these artistically poisoned comfits. The analysis of the *Lancet* has delivered us from this cause of infantile trouble. Nothing but harmless vegetable colors are now used, which if not so brilliant as metallic ones, are quite safe. The production of sugar plums on a manufacturing scale has caused swifter methods of fabrication. The small items, such as rings, scissors, shoes and hats, are cast in starch molds, and the delicate sweets containing some essences, such as pine apple essence and pear essence, are made in the same manner. It puzzles older heads than those of the children to know how this drop of delicious liquid gets into the center of the sweet. Like many other puzzling matters, it is very easily explained. The flavoring essence is mixed with the liquid sugar, and when poured into the mold the latter crystallizes immediately over the former. These essences, so nice to the taste, are the most remarkable examples of the power of chemistry to transform very repugnant materials into delicacies. Fusel oil is the base of the pear essence, and pine apple essence is obtained by diluting ether with alcohol. The chemist in his laboratory with great cunning manufactures scores of these essences, which are supposed to be the veritable product of delicate fruits. Some of the pretty forms that are made to take the fancy of the little ones are simply punched out of flat films of sugar rolled: some are cast, as we have before mentioned; some are pressed into shape, when soft, between engraved rollers. The drops and sweets that are quite clear are boiled so long that all the water has evaporated out of them. Such sweets must be immediately bottled up, or preserved from the air, otherwise they absorb water and become semi-liquid. Barley sugar is an example in point. If it is not hermetically sealed down in tins, it deliquesces, and loses all its crispness. It is as well to know that this is the purest of all sweets—being absolutely clarified sugar, and therefore the most wholesome for children. On the other hand, peppermint drops are the most open to sophistication. They should be made of crushed white sugar, mixed into a paste with gum. But the temptation to adulterate is too great for the dishonest trader to resist; consequently, in order to supply the cheap market, one half plaster of Paris is mixed with inferior sugar. One can quite understand the sickness that overtakes children sometimes after sucking these comfits; the wonder is that such a mass of plaster does not interfere more signally with their digestion. Jujubes, those flexible lozenges which stick so in the teeth, contain a large portion of gum. They are poured into tins to cool, stoved for several hours, sliced into sheets, and then cut by scissors into the well-known diamond shapes.

The veritable sugar plum, or almond drop, is made in a very interesting manner. A number of almonds, after being coated with a little gum to catch the white sugar, are thrown into a deep pan surrounded with steam. This pan revolves sideways at an angle of forty-five degrees. As it revolves the almonds, of course, tumble over one another, and while they are doing so, the workman pours over them from time to time liquid white sugar, allowing sufficient time to elapse between each supply for the sugar to harden upon the comfit. In this way it grows by the imposition of layer upon layer, until it is the proper size. By this simple motion, the sugar is deposited in the smoothest and most regular manner. Girls are largely employed in the sugar plum trade; they are quick, and stick well to their work; but they have a sweet tooth, and help themselves to the lozenges pretty liberally. As it is impossible to stop petty pilfering, they are given liberty to eat as much as they like, and the establishment we went over annually debited itself with a sum of two hundred pounds for the sweets consumed by the children. They certainly did not look any the worse for their unlimited consumption of lollypops, and gave a sufficient answer in their ruddy faces to the old charge against the deleterious nature of sugar plums.

The manufacture of the surprise nuts is done with the utmost speed by these little workwomen. The nut is first opened by means of a rose cutter; the kernel is then cleared out with a penknife, the hollow is filled with seedsweets, and the hole by which they have been introduced is sealed with chocolate. It is great fun, of course, when you have cracked a nut to find your mouth full of these small sugar seeds, whether you expected the surprise or not. In one part of ths establishment we came upon the little artists coloring the small articles cast in sugar. It was all vegetable color, of course, and quite harmless. There is no great artistic talent required in the coloring operations they have to perform, and it is too cheaply paid to be very carefully done; but however poor they may be as works of art they are not unwholesome, which, as we have before said, was far from being the case a few years ago, before Doctor Hassall turned detective officer for the good of our little ones. Here, for instance, is the report of some mixed sugar ornaments, just such as we have described the children coloring:

"Purchased in Middle Row, Holborn. The confectionery in this parcel is made up into a variety of forms and devices, as hats, jugs, baskets, and dishes of fruits and vegetables. One of the hats is colored yellow with chromate of lead, and has a green hat band round it colored with arsenite of copper; a second hat is white, with a blue hatband, this pigment being Prussian blue. The baskets are colored yellow with chromate of lead. Into the coloring of the pears and peaches the usual non-metallic pigment enters, together with chromate of lead and middle Brunswick green. This is one of the worst of all the samples of colored sugar confectionery submitted to analysis, as it contains no less than four deadly poisons." That the fashionable West was guilty of selling sweets equally adulterated with those of the Drury Lane and Holborn shopkeepers, we give in proof one more analysis of a fish purchased in Shepherd's Market, May Fair: "The top of the nose and the gills of the fish are colored with the usual pink, while the back and sides are highly painted with that virulent poison, arsenite of copper." We might describe scores of specimens purchased in every quarter of the town

full of the like poisonous matter, but they are now things of the past. It is a misdemeanor to use metallic color in confectionery; it is just possible, however, that some of the old sweets may still remain unsold, so we bid parents beware of any sugar plums with vivid greens and reds, for they are sure to be poisonous

Steam has helped us to undersell the French; now we export to that country much of the coarser kinds of sweets. In England we make for children, in France the "bonbon" is made for children of a larger growth. Nothing can exceed the taste with which the sweets are put before the public across the Channel. The boxes they are packed in are works of art in themselves. About Christmas time some of our leading West End shops are full of the artistic confectionery from the Parisian manufactories. It looks so pretty that we scarcely like to demolish it. It must be remembered that the presentation of caskets of sweets is a custom among the fashionables in France; our neighbors have, therefore, to meet the critical and fastidious taste of adults, and hence comfits, etc., rise in that country to works of art. We like sweets in this country, but we are too great cowards to own it; we do not doubt, however, that simpler tastes will prevail, and cause more artistic skill to be exhibited than is now thought necessary for our nurseries. If we expect a large export trade it should not be forgotten that other nations require even their sweets to be presented to them in a graceful form. In order to show the increase that has taken place in the trade, we may state that twelve years ago our entire make did not exceed eight thousand tuns, whereas in 1862 it had risen to twenty-five thousand tuns, and is now not very far short of thirty-five thousand tuns per annum. This amount does not include the rough sweets made in the hucksters' shops, nor the toffy made at home, which is not inconsiderable. If the whole nation should go back to the tastes of our childhood, like the French, the production would at once mount up to double the score at which it figures at present. That the English have a sweet tooth, witness our rich port wine, which is in itself a confection, such as no other nation but ourselves under the sun will drink. Such being the natural tendency of our palate, we do not doubt but that we shall take to sweets as naturally as the Italians do, albeit we have no carnival in which to use them as pleasant missiles.—*Every Saturday.*

ACROSS MT. CENIS---FELL'S MOUNTAIN RAILWAY.

"S. H. W." sends us the following supplementary account of his trip over Mt. Cenis:

"We left Turin on the 5 o'clock evening train for Susa, situated at the foot of the mountain, the trip occupying two hours. Upon reaching the station, we learned that the dilligences were not to leave until 2 o'clock in the morning; therefore, betaking ourselves to a small, dismal-looking inn, we obtained a comfortable dinner—anything eatable tasting good to a hungry man. We then bunked down for a quiet nap, but were aroused at 1 o'clock to prepare for a start.

"We found, at the station, a crowd of passengers, who had come up from Turin on the 11 o'clock train; and it was very evident that those who had not secured their places in advance, would have to take up 'with pot-luck.' Being fortunate, however, in this respect, we had only to amuse ourselves by waiting and watching the movement of things. Four immense dilligences were got ready, and, by the aid of a pair of stout horses on the wheel, and five pairs of mules attached to each vehicle, we began to ascend the mountain. The moon was shining full and clear, enabling us to obtain a good view of the scenery; and, after journeying for three hours, during which time we had made but nine miles, the passengers with their baggage were all unloaded, in order to take the dilligence sleighs, as we had reached the regions of snow.

"There were eight of these clumsy-looking vehicles, and to provide for their movement the teams were divided into sixes—one horse in the shafts, led by five mules following each other in line, and presenting a novel sight, as this long procession wound its way up the zig-zags of the mountain. We continued our slow journeyings in this manner for several hours, until we had gained the summit,—the night, owing to the brilliancy of the moon emerging almost imperceptibly into the cold gray of the morning.

"At this point, upon the summit, the mules were dispensed with, and two pairs of heavy horses were attached to each sleigh. The wind blew a sharp nor'wester, the snow came dancing down the mountains, and drifted itself in our way to such an extent that workmen were engaged in keeping the path open. The scene was bleak and cheerless in the extreme. We had been suddenly transferred from the genial sunshine of Italy, to a winter's day as cold and blustering as ever swept over the green hills of Vermont. Even the little mountain cataracts were glazed over by ribs of ice, with pendant icicles. Upon reaching the point where the road begins to descend, one horse only was needed on each sleigh; and right rapidly did he dash down the mountain, the old sleigh swinging around the sharp curves, as if hung upon a pivot. It was our first sleigh ride of the season; and though hungry and cold, we enjoyed it as rare sport, though I judge from home letters that it would have been no great rarity to you. By means of a break, to grip into the snow, which the driver managed with considerable engineering skill, the steep descents and sharp curves were made with comparative ease and safety.

"At the end of the snow region we were all again unloaded and repacked into dilligences, this time drawn by five horses, the leaders working three abreast. There were an army of conductors, drivers, and riders; but no noise, no unnecessary whipping, and no confusion, in making the many changes of vehicles and animals.

"In this way we journeyed to San Michel, the railway terminus on the French side, which point we reached at noon, having in the mean time once again changed horses. At San Michel we were met by the French custom-house officers, who extended to us a cordial reception. The passengers, by this time, were tolerably hungry, and did full justice to the provisions of the restaurant; 'so that the cats and dogs had reason to lament the polish of the bones.'

"An hour's time was just enough to go through the formalities of the occasion, and at one o'clock in the afternoon, we were off again, but this time in a comfortable railway carriage, expecting to stop for the night at a place called Culoz, at the junction of the roads to Lyons, Paris, and Geneva. Upon getting out of the train, however, we found out just in time that there was no hotel short of a carriage ride of three miles to the village, therefore we took the next train for Lyons, where we arrived at half-past ten in the evening. The trip from Turin to Lyons, altogether, combined more of novelty than anything we had before experienced.

"Fell's over-mountain railway, which has already been described in the SCIENTIFIC AMERICAN, follows the windings of the dilligence road all the way from Susa to San Michel, and is a bold curious piece of engineering. The work upon it was suspended during the winter months, but the superintendent expected to have the cars running some time in May.

"Over the higher portions of the mountains, and for several miles along where the snows are most troublesome, the road is being covered in by heavy masonry supporting a corrugated iron roof. Somebody has had faith enough in the success of this enterprise, to spend a vast deal of money upon it; and with a good deal of care bestowed upon the track and machinery, I do not see any reason why it may not be a safe, and, certainly, a much more rapid and comfortable mode of crossing Mt. Cenis than by dilligence.

"Lyons, next to Paris, is the largest city in France. It is, moreover, an exceedingly fine place, built in an excellent situation. The inhabitants live by the manufacture of dress silks, ribbons, and velvets. There are no large factories, but the work is chiefly carried on at the homes of the weavers. Jacquard looms are to be seen through almost every window, as one passes through the quarter occupied by the weavers, and a fine monument to the great inventor has been erected in one of the public places. At the present time weaving is very dull, and the operators are suffering considerably.

"The distance from Lyons to Paris is 319 miles; the express train runs through in ten hours, including fourteen stoppages. The railway is a model of good management."

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Correspondence of the Sun with the Clocks.

MESSRS. EDITORS:—One of your correspondents asks, page 197 of this volume, "Why is the sun's center on the meridian ever back of the clock?" and you answer: "Because of the elliptical orbit of the earth, and the inclination of the earth's axis on the ecliptic." Allow me to remark that the sun's center is *not* always back of the clock, but half the time ahead of it, and that the inclination of the earth's axis has nothing to do with this phenomenon, which constitutes the difference between the mean time and solar time. The explanation is this:

On a well regulated clock, the days of twenty-four hours have of course exactly the same length; but the solar days, when measured by the time that the sun daily reaches the meridian, have not the same length; this is not caused by any irregularity in the daily rotation of the earth around its axis, as this rotation is perfectly regular, and proved by the most acute astronomical observations not to vary the least fraction of a second during several centuries (at least, at the present stage of the earth's existence); but it is caused by the fact that the earth, during its yearly revolution, does not remain at the same distance from the sun, its orbit being an ellipse, as you remarked in the answer above; the earth thus moving sideward in relation to the sun, and at the same time alternately approaching or receding, accelerating and retarding in its yearly orbit, causes an irregularity in the apparent place of the sun at the time of its crossing the meridian, or, in other words, the apparent daily motion of the sun is sometimes accelerated and sometimes retarded, and therefore the center of the sun passes the meridian sometimes before noon and sometimes after, when this time of noon is taken by a well regulated clock.

Tables have been calculated, founded on observation, how much these differences are for each day of different years, to within a fraction of a second, and such tables, with many others, are published several years in advance, by the Government at Washington, for the use of navigators, under the title of *American Ephemeris*. I extract from the *Ephemeris* for 1869 the following facts:

On Jan. 1, 1869, the sun will be behind the well regulated clocks nearly 4 minutes; March 1, nearly 12½ minutes; April 15, the sun will be nearly equal with the clock; May 15, the sun will be ahead nearly 4 minutes; June 15, the sun will be nearly equal with the clock; July 26, the sun will be behind nearly 6½ minutes; Sept. 1, the sun will be nearly equal with the clock; Nov. 2, the sun will be ahead nearly 16½ minutes; Dec. 24, the sun will be nearly equal with the clock.

It will be seen that the sun is four times a year equal with those well regulated clocks, which indicate the mean or average time, namely, April 15, June 15, Sept. 1, and Dec. 24; the sun is twice a year ahead of the clocks, namely, from middle of April to middle of June, and during the months of September, October, November and December; for the rest of the year the sun will be back of the clocks, and this change is taking place very gradually from day to day; the maximum days are given above.

Those dates and times shift slightly for other years, but to so small an extent as to be of importance only for navigators and astronomers, the same as the seconds and fractions of seconds given in the government tables, which I neglected in the above extract, for obvious reasons.

P. H. VANDER WEYDE, M. D.

Steam Temperature and Expansion.

MESSRS. EDITORS:—The expansion of saturated steam depends upon the temperature, and its pressure is about in propertion to its density. The expansion of a given pressure is easily found by formulæ patent to those who pretend to any theoretical knowledge upon the subject. Saturated steam does not exactly expand in accordance with the Mariotte-Gay-Lusac law, nor does any vapor, or even atmosphere, follow correctly the aforesaid law; in fact, the engineering world has to make the calculation by formulæ based upon practical results, obtained experimentally. The expansion of steam cannot be found correctly for any given pressure or temperature by the use of one formula. The existence of over forty-five different formulæ prove that we know as much about the expansion of steam as we know of the square of a circle; furthermore, steam (superheated steam) can exist at all temperatures, even below zero; if such was not the fact there would be no water in liquid form on the globe; it would have been long before this time, changed into solid ice at the polar regions.

It requires but a few words in order to show the error of Mr. Sisson's ideas regarding his own theory on expansion of steam. (See page 52, current volume.)

It is a well known fact to almost every apprentice in a machine shop, that steam engines cutting off steam, at usual pressure, at one fourth stroke, or below, still exhaust steam at a temperature above 212° of heat; if Mr. S.'s assertion be true, it would prove all steam engines cutting off steam at one half stroke, or below, a nuisance, they could not exhaust anything but water at a temperature far below the boiling point. Did this fact ever occur to Mr. S.?

Mr. S. also affirms that steam at seventy-five pound pressure cannot expand to twice its bulk without going below 212° of heat. I would advise Mr. S., in order to convince himself of the utter fallacy of his ideas upon steam expansion, to place his hand into the exhaust pipe of an engine that is working steam at seventy-five pounds pressure, at one fourth stroke, and I affirm that he will find nothing left of his theory but a burned hand.

Mr. S. speaks of expanding temperature to double its bulk, etc. Does Mr. S. measure heat by the bushel, or by weight?

Buffalo, N. Y. H. W. D.

House Fly Parasite.

MESSRS. EDITORS:—One afternoon, during the summer of 1866, a common house fly attracted my attention, from being thickly bespread with what seemed to be a red powder. After capture I detached some of the colored matter and placed it under the microscope, when it was immediately resolved into well developed insect life, apparently of the "tick" family, and of a cochineal color; repeated observation and experiment gave like result, then, and in the summer of 1867.

Having never seen an account of similar experience, nor met with any who have, perhaps your extended observation and acquaintance might throw some light on the matter, as to whether the occurrence is general, or confined to locality; or whether the fact has any bearing on the transmission of diseases among humanity. The latter idea may appear farfetched, but it will be recollected that flies were at one time a plague to the Egyptians; probably from quantity, but possibly from some other cause. Judging roughly, it would seem a fair estimate to say, that did human parasites bear the same proportion to man, as those spoken of to the fly, we should have fleas and other "outside passengers" of about one fourth pound each in weight. ENTERPRISE,

Cincinnati, O.

Potassium and Sodium in Manures.

MESSRS. EDITORS:—On page 217, present volume of your paper, I notice an article stating that M. Eugene Peligot disapproved of the use of potassium and sodium as fertilizers, because by experiment he could find no traces of their presence in vegetables grown on soil where they had been used. Now, I used a quantity of compound sodium, that is, in the form of carbonate of natron, on my farm, and thereby made five spears of grass to grow where one grew before, and twice as stout. Yet, by analyzing the vegetable, I would not, perhaps, find a particle of sodium, while it was the very element of its growth. I pretend to say that potassium, or sodium, especially when combined with carbonic acid, is of the greatest benefit to vegetables. They undergo chemical combinations with the soil, thereby setting other substances free which nourish the plants. E. C. HASERICK.

Lake Village, N. H.

Self-adjusting Telegraph Magnets.

MESSRS. EDITORS:—Your correspondent, "S." (page 178), in asserting that a self-adjusting magnet is an impossibility, evidently refers only to the case of lines worked with two terminal main batteries and a "closed circuit," as is the usual custom in this country. If the transmitting station *only* uses a battery, it is evident that the key will break the *whole* of the electric current in all cases. This is known as the "open circuit" arrangement, and was formerly employed on the Bain lines in this country, and is at the present time much used in Europe.

The vital principle of Duxbury and Roberts' system referred

to by your correspondent, D. C. S. (page 211) is that of working with reversed currents, the dots and dashes being transmitted with one poole of the battery and the spaces with the other by means of a reversing key. This method necessarily renders the receiving magnet self-regulating, because the same force is alternately used to move the lever in one direction and the other, opening or closing the local circuit as the case may be. This principle of working reversed currents is as old as the English needle instrument of Cooke and Wheatstone. The Morse system has also been worked with reversed currents for a number of years in Europe, with the best results, the relay being composed of a straight, soft iron bar movable within its helix, and which plays between the opposite poles of two fixed permanet magnets. This is obviously better than Duxbury and Roberts' plan of using neutralizing local batteries, whose electro-motive force is necessarily variable.

In his communication, "S." remarks that "a self-adjusting magnet must be one that will obey changes of current, no matter how slight, when made by the operator, but will refuse to act from accidental causes, however great," and as no magnet can do this, therefore, a self-adjuster "is an impossibility." If the accidental disturbing cause, produces a greater effect on the receiving instrument than the transmitting key at the remote station, it would clearly be equally impossible for an *operator* to adjust his instrument so as to receive the communication. What is needed in an instrument of this kind, is merely that it shall do its work *as well* as a practiced operator, and I see no reason to doubt the possibility of the invention of such an instrument adapated to the requirements of the Morse lines as now worked in this country.

Electron.

New York city.

Rattlesnake Poison---Its Antidote.

Messrs. Editors:—On page 198, current volue, of your journal I notice a statement that Dr. S. W. Mitchell, of this city, has been experimenting upon the venom of rattlesnakes, and thinks there is no antidote to the poison, the remedies usually applied being nearly or quite useless.

I was somewhat disappointed at this announcement, as I had hoped and believed that we had found a perfect antidote to all poisons of reptiles and insects, in iodine and iodide of potassium. Several years since, Dr. J. S., now of this city, informed me that he had practiced medicine for 18 years near the Blue Ridge, in this State; that during that time he had had a number of cases of rattlesnake bite, and never failed to cure with iodine, or iodide of potassium, externally applied.

Inclosed I send you an article, cut from a paper published some two years since. I am anxious to learn if Dr. Mitchell has tried this remedy and found it of no use:—

"After many experiments by the officers of the Smithsonian Institute, and other scientific gentlemen, a certain cure is said to have been found for snake bite. It is as follows: Ten grains iodide of potassium, and thirty grains iodine, to be dissolved in one ounce of water, to be kept in a bottle with a ground glass stopper, and to be applied externally—*never internally*. If possible, stop the circulation in the parts bitten by bandaging, and use a stick or anything to tighten the bandage, and apply the solution to the bite with a piece of cotton, sponge, or anything that will hold the fluid, and then bind it to the wound and keep wet until the cure is effected. It is said that five drops of undiluted poison from the fangs of a rattlesnake, mixed with five drops of the above solution, and inserted in a wound with a syringe, was as harmless as ten drops of water." D. S.

Philadelphia, Pa.

Messrs. Editors:—I see an article in No. 13, current vol., on the poison of rattlesnakes, in which Dr. Mitchell, of Philadelphia, asserts there is no antidote to the poison of rattlesnakes. I will state, for the information of the Doctor and others, that there is an antidote for the poison of the prairie rattlesnake, the large yellow rattlesnake, and copperhead snakes. I will give the remedy so that no one can mistake. Take a handful of garden rue; bruise it with a hammer; lay it in a dish, and add half a pint of the best cider vinegar, and then let it stand for five minutes. Then take a rag or sponge and apply or bathe the snake-bite wound with the liquid of the rue; then, after bathing a few minutes, take the rue out of the vinegar and apply it, as a poultice, to the wound, and renew the poultice as long as there is fever, and the cure is effected permanently. Alcoholic liquors are very good, but rue and vinegar will relieve all pain in five minutes after being applied. I have seen it tried on four persons, and also on horses and cattle, and never knew it to fail.

Isaac B. Hymer.

North Manchester, Ind.

Vaccine Virus---Inoculation for Small Pox.

Messrs. Editors:—In a recent article on the cholera, in the Scientific American, the casual remark is made that "the small pox is made harmless by passing the disease through one of our domestic animals."

Although this is the popular belief, it is not true, in fact. Vaccine matter was originally obtained from an irruptive disease peculiar to the cow, and, for aught I know, is still so obtained as occasion or opportunity may offer, and not by inoculating one of those animals with the virus of the small pox, as many suppose.

Many years since the small pox broke out in my native town; a young resident physician, acting on this idea, and desirous of procuring vaccine matter as pure as possible, inoculated a healthy young cow with matter from one of his patients, and with matter thus obtained inoculated a number of children. The result was the small pox, in its worst form.

Perth Amboy, N. J. G. O. Read.

Royal Institution.

The London *Engineer* says: Prof. Tyndall has closed his series of lectures on "The Discoveries of Faraday," the last two afternoons of the series being devoted to the explanation of the phenomena of diamagnetism, and the action of the magnet upon rays of light. The experiments were, therefore, necessarily of a very curious and interesting description, the following being one of the best of them:

In the annexed engraving, Fig. 1, A is the electric light between the two carbon points; B and C are Nicol's prisms to

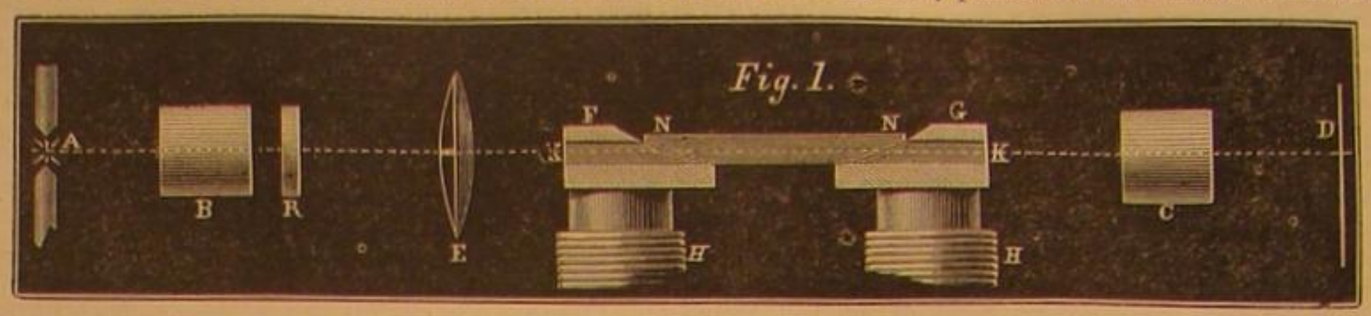


Fig. 1.

polarize and analyze the ray of white light, A D. A double convex lens is placed at E, and F G are two movable poles of peculiar shape placed upon the top of the electro-magnet, H H. The square movable soft iron poles have holes through them, K K, to permit the passage of the ray of light. N N is a short square transparent rod of Faraday's heavy glass. R is a thin transparent circle of quartz, composed of two half circles, one being a piece of right-handed quartz, and the other a piece of left-handed quartz, placed opposite to each other, and so arranged that the two halves should give either complementary or the same colors in the polariscope. The lecture room was darkened, then a beam of light was sent through the whole arrangement described above, and the lens, E, so adjusted that a small circle of light was projected upon the screen, D. The quartz circle, R, was then turned till its two halves gave exactly the same color upon the screen. Upon sending a current of electricity round the electro-magnet, H H, the magnetism produced exerted some peculiar action upon the piece of glass, N N, which caused one half of the circle of light upon the screen to change to a red color, and the other half to a green. When the current was sent round the magnet in the opposite direction the colors upon the screen were reversed, the red and green changing sides with each other. Upon breaking the current the whole disk assumed its normal puce color, both halves of the circle being then alike. When the piece of heavy glass was removed from between the poles of the magnet none of the effects just described could be produced, thereby proving that the magnetism sets up some change in the molecules of the heavy glass.

In place of Faraday's heavy glass a solution of sugar without the aid of magnetism, will cause the plane of polarization to rotate. But this phenomenon is not exactly of the same kind as that discovered by Faraday. For instance, if the ray be sent through the solution of sugar it will cause the plane of polarization to rotate in one direction, and if it be reflected back again, through the solution, it will be rotated in the other direction, and these two actions will neutralize each other. When the ray, on the other hand, is reflected back again through the heavy glass the original effect is increased instead of neutralized. Faraday's method of reflecting the beam several times through the glass was a marvel of experimental ingenuity and simplicity, as shown in Fig. 2, where A is a square block of heavy glass. B B are the portions of the two ends of the glass which were silvered to produce the desired reflections. Now, let a candle be placed at F, a ray of light from it would traverse the glass in a straight line, and enter the eye at H, without being reflected. But let the candle be shifted to E, and the ray of light would have to be reflected twice, as shown by the dotted lines, ere it could enter the eye. On shifting the candle, E, still further to the left, the ray must undergo a still greater number of reflections ere it could enter the eye.

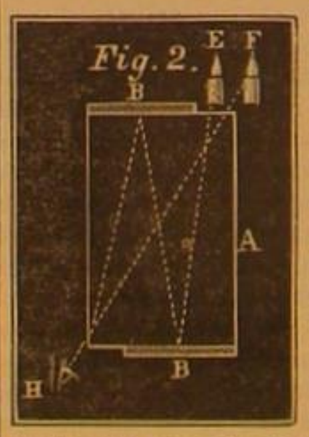


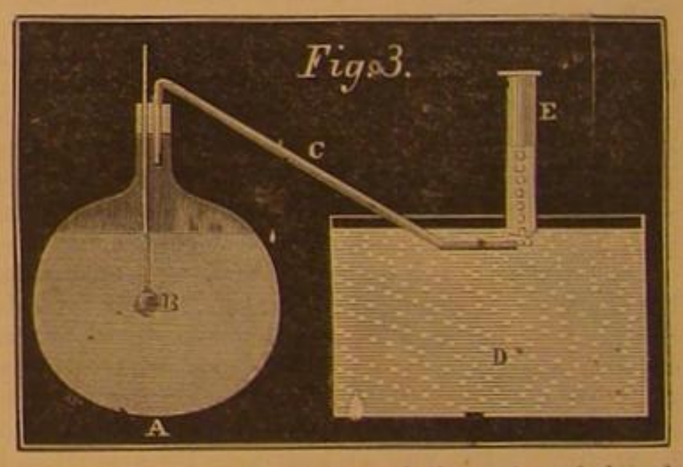
Fig. 2.

The lecturer stated that although Faraday was very bold he was very cautious, and he never ventured to express an opinion as to the exact change in the position of the molecules of the heavy glass set up by magnetism. As far as Professor Tyndall knew, Sir William Thomson is the only philosopher who has ventured an opinion upon the subject, and he thinks that in this experiment the magnetism makes the molecules of the heavy glass take up a motion of rotation. To show that in all probability magnetism brings a strain to bear upon the molecules of heavy glass, Professor Tyndall took a prism of this substance and bent it in the polariscope, and the strain enabled light to find its way through the prisms of Iceland spar, although the latter were so arranged that light could not get through till the prism of glass under strain was interposed. Biot's new experiment, wherein a long piece of glass vibrating longitudinally is placed crossways between the prisms of the polariscope, was also exhibited to show that glass under the influence either of a strain of tension or a strain of compression has an action upon polarized light.

After the discovery of the effects of magnetism upon polarized light, Faraday hung a piece of heavy glass by a thread between the poles of his electro-magnet, and found that the bar placed itself at right angles to a line joining the poles. He then tried other substances, and tabulated the results, giving at the same time the name of diamagnetism to the new phenomena. The experiments in diamagnetism were difficult te present to a large audience, because of the smallness of the effects, but Prof. Tyndall overcame the difficulty by placing an electric lamp in front of the electro-magnet, and throwing a large shadow of the latter upon the screen. Hence any motions of little pieces of bismuth or other diamagnetic substances were seen upon the screen by everybody present. Pieces of carrots, apples, and such things were thus shown to be acted upon by magnetism. The lecturer specially pointed out the remarkable fact that although nitrogen is inert to the magnetic force, and oxygen is attracted by it, yet nitric acid is diamagnetic. Lastly, he exhibited the action of the magnet upon flame, by placing a lighted candle between the closely approximated poles of the electro-magnet. When the magnetism was induced by the electric current, the flame instantly bent down as if a stream of wind were blowing between the two poles.

Mr. Harcourt, Secretary to the Chemical Society, gave a Friday evening lecture at the Royal Institution on "The Times in which Chemical Actions take place." His experiments were in some cases so delicate as to be more fitted for the laboratory than the lecture room, but were of a very curious character, trenching upon a quite untrodden branch of molecular physics. He added some chloride of barium to sulphuric acid, the result being that a white milky precipitate was instantly produced. Next he added chloride of calcium to sulphuric acid, and the sulphate of calcium formed so slowly that the liquid took many minutes to turn milky. Some sulphurous acid was next added to a weak solution of bichromate of potash, a green color being immediately produced. But when oxalic acid was added to a solution of bichromate of potash, decomposition took place very slowly.

In the next experiment Mr. Harcourt heated solution of nitrate of ammonia very carefully, the result of heating this salt to a temperature short of 212° F. being to resolve it into nitrogen gas and water. As the salt in the solution diminishes in quantity the volume of gas given off becomes less and less. To make this experiment with scientific accuracy the lecturer nearly filled a flask, A, Fig. 3, with the solution, and a Centigrade thermometer, B, was fixed in the cork,



Figs3.

so that the bulb should be beneath the surface of the solution. A bent tube, C, conveyed the gas as it was formed into the pneumatic trough, D, where it was collected as fast as formed in long narrow gas jars similar to that at E. The mode of operating was this: A flame was applied beneath the flask, A, and the temperature of nitrate of ammonia gradually raised to 88° Cent.: when this degree of heat was reached the flame was turned down to keep the solution steadily at this temperature. The gas generated before this temperature was reached was allowed to escape. When the liquid kept steadily at 88° Cent., the gas given off was allowed to flow for one minute into gas jar No. 1, next for one minute into jar No. 2, and so on till five jars had been used, each containing the quantity of gas given off in one minute by the solution at a fixed temperature. The result proved that there was a relation between the quantity of nitrite in the solution and the quantity of gas given off. The jars, when arranged on the lecture table, gave the rough outline of the curve, A B D, Fig. 4.

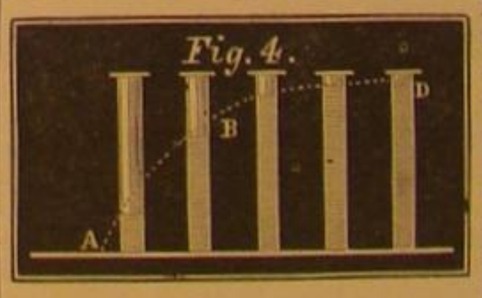


Fig. 4.

In the next experiment four flasks were half filled with a solution of oxalic acid, a little sulphuric acid being also added, simply to quicken the action in the presence of the audience. A little measured permanganate of potash was then added to the first flask; half a minute then elapsed, and a little permanganate was added to the second flask, and so on throughout the series, half a minute being allowed between the measured additions to each flask. A yelow precipitate gradually formed in each flask after the addition of the permanganate. Next a solution of iodide of potassium was added to each flask, and this stopped the action going on by destroying all the undecomposed permanganate in the solution, iodide being liberated in its place. As it is possible to measure the exact quantity of iodine thus liberated, the quantity of per-

manganate undecomposed when it was added can be ascertained, and the amount of decomposition in a given time tabulated. The lecturer then read some tables formed from similar experiments, which among other things showed that heat considerably accelerates chemical decomposition.

Lastly, Mr. Harcourt attempted a more complicated experiment still, too delicate for the lecture room; it did not go off well, nor were the conditions clearly explained. The lecture, as a whole, however, was of high philosophical interest, the experiments belonging, as they do, to a new and untrodden field. Some curious experiments of a different kind, on the time in which chemical actions take place, were described in *The Engineer* two or three months ago, under the title of "Molecular Physics."

Other curious facts relating to the time consumed by chemical actions are shown in the combustion of Capt. Schultze's new gunpowder, now under trial by the Prussian government. This powder burns very slowly in the open air upon a plate, and leaves a bulky black deposit, yet when inclosed in a gun it explodes with great velocity, and leaves no deposit.

On Friday, March 13th, Mr. Jevons gave an evening lecture at the Royal Institution, on the "Exhaustion of our Coal Mines," Sir Henry Holland, Bart., F.R.S., presiding.

Mr. Jervons said that his remarks would be principally based upon the fact that the amount of coal extracted from the mines of Great Britain in the year 1866 was 101,000,000 tuns, while that of the whole world was as nearly as can be ascertained 176,000,000 tuns, our country thus producing 73 per cent of the whole. In regard to bulk and weight it is by far the greatest trade we have, as shown by the following figures:—

Total Weight of Goods (except Live Stock) Carried in 1865 *upon the Railways of the United Kingdom.*

	Tuns.
General Merchandise	36,800,000
Minerals (approximately)	18,300,000
Coal and Coke (approximately)	59,500,000
Grand total in 1865	114,600,000

A few of the railways, in their returns, did not distinguish coals and minerals, hence he has been obliged to separate them into the proportions carried by other railways, and the result was not far from the truth. Half the carrying power of British railways is occupied in conveying this coal, which is the "philosopher's stone" of the country, not because it turns everything into gold, bnt because it makes everything cheap, does so much work, and is the maintaining of the material power of the nation. These results are due to the fact that it is capable of producing heat in such great quantities, and heat and mechanical power are convertible terms. It is rather a humiliating fact that all the mechanical power exerted by a man during his life is more than covered by the power stored up in one poor cart load of coal. In fact, the annual coal produce of the United Kingdom is equivalent to the power exerted by 530,000,000 horses, working eight hours per day, for one year. The work of raising this coal is something immense. The Great Pyramid is reported to have been raised by 100,000 men, working for twenty years, and it contains 3,394,307 cubic yards of stone. The coal raised by about 250,000 British coal miners in the year 1865 was about 100,000,000 cubic yards, or thirty times the bulk of the Great Pyramid.

If the use of coal did not tend to increase, and the present annual yield of 100,000,000 tuns in these islands did not tend to alter, he should have little to say upon the subject, but the above quantity is only a starting point. If it were not so there need be no fear, for the probable quantity of 83,000,000,000 tuns of coal in the mines of the United Kingdom, at a depth of not more than 4,000 feet, would would keep us going for another 835 years, a period equal to that which has elapsed since the Norman conquest. But the coal consumption is not stationary, as shown by the following table:

Year.	Coal raised, Tuns.	Coal exported, Tuns.
1854	64,600,000	4,300,000
1855	61,400,000	4,900,000
1856	66,600,000	5,800,000
1857	65,300,000	6,700,000
1858	65,000,000	6,500,000
1859	71,900,000	7,000,000
1860	83,200,000	7,400,000
1861	85,600,000	7,200,000
1862	83,600,000	7,600,000
1863	88,200,000	7,500,000
1864	92,700,000	8,000,000
1865	98,100,000	8,500,000
1866	101,630,000	9,267,000

Thus in twelve years the consumption of coal has advanced rapidly, and in all directions it is easy to see how that consumption tends to increase. Small engines, among other things, are daily creeping more into use, and he thought it likely that the day was not far distant when nearly every house would have its own little gas engine to work a sewing machine, or to assist in other household matters. In agriculture there is a growing demand for steam power, which is also wanted for hydraulic purposes, for the water therein ueed is commonly pumped up by steam. No engines give the full amount of mechanical power contained in burning coal, but even the economizing of coal, strange to say, tends to increase the consumption, for steam power becomes cheaper the less coal the engine consumes, thus increasing the demand for machine power. In common fire grates a vast amount of heat is wasted, and goes up the chimney without doing any good at all; this waste he hoped to see stopped to a very great extent.

Upon examination of the government returns it is seen that trade tends to increase in geometrical and not in arithmetical progression, and the increase of consumption of coal follows the same law, which applies to almost all branches of human industry. The yearly increase in the consumption of coal shows a tendency to follow this law, at which rate of progression the store of coal in the United Kingdom, instead of lasting 800 years, is likely to be used up in a a small fraction of that time. Like the problem of the nails in the horse's shoe in the arithmetic-book, figures mount up in a most surprising manner under the system of geometrical progression. The quantity of coal sent out from England for several centuries has steadily followed this law. In another twelve years, therefore, the annual demand for British coal is likely to reach 1,000,000,000 tuns, as he (the lecturer) had published in a table some months back, and was much ridiculed for giving such high figures. He did not believe that the coal fields of Great Britain could produce 1,000,000,000 tuns a year, and if this be the fact, industry and trade cannot progress here in the future as in the past. Temporary depressions make a difference in the produce, and 1868 might show a falling off in the coal trade in the same way as in 1855 compared with 1854, but such disturbing influences are only transient. He did not doubt that there is coal at a greater depth than 4,000 feet, but the supply of it will be scanty, and the cost of raising it very heavy.

Lord Russell once sent a circular letter to the consuls to send home figures about the supply of coal in different foreign countries. The totals are here given as accurately as possible:—

Yearly Produce of Coal.

Country.	Tuns.
Great Britain	101,800,000
United States	25,800,000
Zollverein	20,610,000
France	10,710,000
Belgium	9,935,000
Australia	4,500,000
British America (estimated)	1,500,000
Russia (estimated)	1,500,000
Spain	300,000
New South Wales	250,000
Ireland	123,000

Of all the nations in the above table, the United States has the greatest stock of coal, the area of its coal fields being 196,650 square miles, while in Great Britain the area of coal is only 5,400 square miles. Yet, in spite of this disproportion, the United Kingdom gets rid of much more coal annually than all the rest of the world put together.

Sometimes the remark is made that a substitute for coal will be found. The newspapers are fond of repeating proverbs on the point, such, for instance, as "Necessity is the mother of invention," or "Where there's a will there's a way." Proverbs are out of place in the consideration of such a serious subject, moreover the last proverb quoted has no truth in it. Electricity will never supply the place of coal, because the metals burnt by chemical action in all the batteries have first to be smelted by means of the heat of coal, and in the different induction machines, such as Wilde's, for the production of electricity, the driving power is derived from coal. A letter from Prof. Tyndall now before him (the lecturer) said that he saw no prospect of any other large source of heat and power besides coal, and when that is gone we cannot hold our own against other nations. He (Prof. Tyndall) had stated over and over again in his lectures that the future prospects of Great Britain are more in the hands of its coal owners than in the hands of its statesmen. When coal is gone, the heat of the sun and the motion of the tides are the principal sources of power remaining.

Few, said Mr. Jervons, have attempted to form an opinion as to the full meaning of the falling off of our supply of coal. The increase of national wealth depends upon the increase in the the consumption of coal, so that when the latter declines, the national life will be shortened. Then the progress of the nation will gradually cease, employment will become scarce, and emigration will set in to a larger extent. There is a possibility that Great Britain will be thus stopped in 100 years from this date, but many other nations, especially the United States, will feel no such check. Yet in 50 or 100 years coal will have become even more indispensable than it is now. What shall we do? Shall we lay a tax upon coal? Shall we stop its exportation? He did not see that we have any right to do either of these things. Mr. John Stuart Mill, the great political economist of the age, says that while thinking of the loss of coal, we ought to connect with it the fact of the national debt. Supposing a colliery proprietor to be heavily in debt, and to possess the knowledge that in course of years his mines would be exhausted, he would at once begin to capitalize. The British nation ought to do the same and try and pay off its debt in the days of prosperity. Mr. Jevons thought this course should be taken also; better still that the population of the country should be thoroughly educated to understand these and other vital questions, and to get rid of those laws and other causes which now produce pauperism; thus he thought the public would be better prepared than at present for the days of trouble. It must not be forgotten that Mr. Jevons' conclusions are stoutly disputed by many high authorities. Mr. Jevons overestimates our future rate of consumption, we think.

Prof. Roscoe, F.R.S., is now delivering a Saturday afternoon course of very instructive lectures on chemistry at the Royal Institution, of which lectures we shall have more to say hereafter.

A Remarkable Medicinal Spring, on the island of Jamaica, has just been brought to notice. An analysis of the water, which Dr. Attfield reported at the last meeting of the London Pharmaceutical Society, shows that every gallon contains about 3½ ounces of chloride of calcium, 2 ounces of salt, and 2½ grains of chloride of ammonium. The proportion of chloride of calcium, Dr. Attfield believed to be unprecedented. The therapeutic action of this salt is most useful for the treatment of scrofulous affections, and glandular swellings, a fact known to the negroes on the island, who have valued and used the water for medicinal purposes upwards of forty years.

Marine Paint.

This paint is produced by incorporating a pasty mixture of white lead and boiled linseed oil with a pasty solution of caoutchouc, or gutta percha, and a sufficient proportion of boiled linseed oil to reduce the mixture to a proper condition to be spread with a brush upon wooden, metallic, or canvas surfaces. The best paint is produced by the combination of a pasty mixture of white lead and boiled linseed oil with about an equal portion of a pasty solution of caoutchouc, or gutta percha, and a sufficient quantity of boiled linseed oil to reduce the paint to the desired working condition. The caouutchouc, or gutta percha, may be reduced to a pasty condition by the use of naphtha oil. The surface produced by the use of my improved paint is remarkably adhesive, tough, elastic, and durable, when exposed to the action of air or water. When the bottoms of marine vessels have been thoroughly and sufficiently coated it has been found to prevent the attachment thereto of barnacles and other parasitical or vegetable growths, and also the ravages of the teredo, or "borer." Patented by Gilman Hook, West Harwich, Mass.

CLARKE'S PATENT FILE FOR PAPERS, MUSIC, ETC.

So many journals, the value of which is not exhausted by a first reading, are now published in quarto form, requiring to be cut for convenience in reading, that a file or temporary binding is a great convenience. By this means the papers can be kept clean and free from folds and creases, ready for the binder when the volume is completed. The cheap construction, however, of some and the unhandiness of others are objections to their use. The one illustrated in the engraving appears to be free from these objections, as it is very strongly made and the papers may be readily put in without punching holes or otherwise injuring the sheets. Any required papers may be taken out after filing without disturbing any of the others. The back of the binder is a plate of stiff sheet metal of a width sufficient to hold the weekly issues of six months to form a volume, and it is secured on each side of its whole length to wing sheets, by a hinge formed the whole length of the plate. These wing plates, being solidly secured to the lids of the file, make the device very strong.

Fig. 1

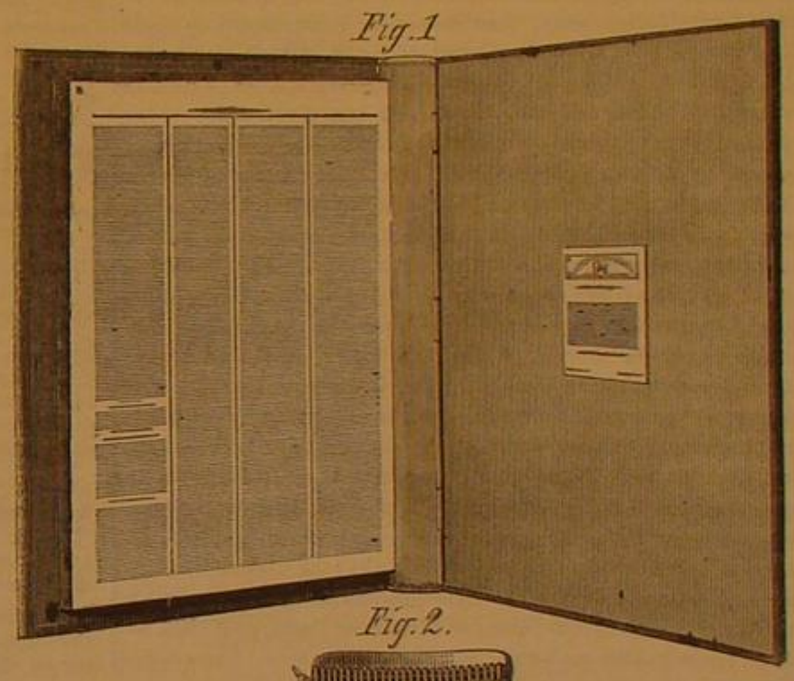


Fig. 2.

Each end of the back plate is formed into a comb of backward bent teeth, between the interstices of which are introduced pieces of elastic cord knotted at each end to hold them in place. This arrangement is shown plainly in Fig. 2, Fig. 1 showing the file opened and containing papers.

In using the file a paper is opened in the middle and slipped under one of the elastics which, holds it firmly in place. Should one of the cords break it may be replaced in a moment by another, but they last a long time by proper usage.

Patented through the Scientific American Patent Agency, Dec. 3, 1867, by John C. Clarke, who may be addressed, Box 53, or 122 Railroad avenue, Jersey City, N. J.

Consumption and Its Cure.

The latest writer on this subject is a Dr. Carl Both, a physician who studied his profession at Göttingen, Würzburg, and Marburg, and who, having made this disease a special study for many years, has published at Boston an explanation of a newly-discovered method of treatment. In regard to the nature of consumption, Dr. Both utterly rejects the notion of hereditary transmission, and finds its cause in imperfect respiration at the time of birth, the formation of tubercles, he asserts, only taking place in those parts of the lungs where respiration has been repressed or has entirely ceased. Our author was convinced that consumption was not, as he had been taught to believe, incurable, from being present at a *post mortem* examination at Würzburg, when he noticed this fact, that tubercles had formed in the subject's lungs, and had healed themselves without any medical treatment. The diseased parts had the appearance of chalk, although the original cells and tissues could be detected by the microscope. From this and other cases of the same kind that came to his knowledge, he made up his mind that if nature could cure consumption by her own processes it was possible to effect the same result by medical treatment. To discover nature's mode of cure was his first object, and after patient study he

finally became convinced that this process was the calcification of the diseased parts by means of lime furnished by the blood, and on this discovery he bases his method of treatment. Dr. Both does not attempt the expulsion of the diseased cells, but allowing them to remain as bad tenants, his object is to cut off all nourishment from them, to incarcerate and thus render them harmless. To attain those objects his first step is to press air into the lungs by natural inspiration powerfully stimulated by certain muscular exercises, which should in every case be taken under the direction of a physician. This causes an increase of coughing, which the doctor regards as a remedial action of nature intended to expand the lungs and expel the diseased matter, and rarely produces any favorable effects before the fourteenth or fifteenth day. He next attempts to purify the blood by regulating the patient's diet. Vegetable acids containing abundance of oxygen are best adapted for this purpose. The next step is to introduce phosphorus and sulphur into the blood, which he does by prescribing a diet in which coarse bread, green corn, mustard, horse radish, etc., figure largely. Lime, silica, and magnesia are likewise introduced by means of diet. The new system is equally efficacious in all climates, in all seasons of the year, and in all conditions of the weather.

Effects of Light on Vitality.

In a remarkable paper addressed to the French Academy of Sciences, Dr. Dubrunfaut examines the effects of light on vegetable and animal life. The researches of MM. Gratiolet, Cloëz, and Cailletet have in a great measure proved that the red rays of the luminous spectre are those to which the important physiological function exercised by the sun on plants is to be exclusively attributed. The leaves in this case act as analysers of white light; they reject the green rays, which constitute the physical complement of the red ones; and it is thus the various hues under which the organs of vegetation are seen by us may be explained. If plants were exposed to green illumination only, that would be tantamount to their being in the dark. But this kind of light, which the vegetable kingdom refuses to absorb, is precisely that which is coveted by the animal one. Red, the complementary color of green, is that which, owing to the blood, tinges the skin of the healthy human subject, just as the green color of leaves is the complement of the one they absorb. From this principle, so fully established by experiment, M. Dubrunfadt passes to its practical application to domestic life. All kinds of red should be proscribed from our furniture, except curtains. Our clothes, which in point of fact play the part of screens, should never be green, while this color, on the contrary, should predominate in our furniture, its complementary one being reserved for our raiment. In the same way he contends that the salubrious influence of woods and forests is a luminous, and not a chymical effect. In support of these views he mentions cases of patients whose broken constitutions were restored merely by long exposure to the sun in gardens deprived of trees or other obstacles to light; he quotes the instance of four children that had become chlorotic by living constantly in one of the narrow streets of Paris, and that regained their health under the beneficial influence of the solar rays on a sandy sea coast.

TELEGRAPHY IN SWITZERLAND.—The reduction of the tariff upon telegrams in Switzerland, to a uniform charge of half a franc (ten cents) a message, has not proved the failure that many anticipated. In January, 1867, the number of dispatches throughout the country was 50,513, against 86,461 for the same period in the present year. A comparison of the amount received will show that the revenue has not diminished in consequence of the reduced tariff. In January, 1867, the receipts were about $11,900, against $13,060, during the same period this year.

NATURAL ILLUMINATING GAS.—The New Orleans gas company seem likely to find a formidable competition in the sources of natural gas, which have been discovered in several places near the city. It is only necessary to sink an iron tube to a depth of forty feet, when the gas begins to flow out with great steadiness, at the rate of five feet per hour, and is accumulated in suitable reservoirs. The natural gas burns with a clear, white flame, equal, it is said, to the best purified coal gas.

HAIR CURLING LIQUID.—Some of our straight-haired young lady friends, who are troubled to coax their locks into the prevailing frizzy style, are advised to try the following recipe: Take borax, two ounces; gum arabic, one drachm; add hot water (not boiling), one quart; stir, and as soon as the ingredients are dissolved add three tablespoonsful of strong spirits of camphor. On retiring to rest wet the hair with the above liquid, and roll it in twists of paper, as usual.

PIMPLES AND FACE WORMS.—The following is for the benefit of our young gentleman readers: The most simple cure for eruptions on the face is to bathe it twice or thrice a day with camphor spirits. As these eruptions are caused by the impurity of the blood, perhaps the best plan would be to consult a physician. Flesh worms may be eradicated by taking every evening, for a few weeks, as much sulphur as will cover the blade of a penknife.

DOCTOR POLLION, of France, recommends the inhaling of hartshorn for curing colds in the head. The inhalation by the nose he recommends seven or eight times in five minutes. We have frequently used spirits of camphor in the same manner with beneficial results.

So far as the solid earth or the unstable sea is concerned, man is king; but he has yet to conquer the ocean of air above him.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The first through train from New York to Sioux City reached that point on the 30th ult., having left the former place nine days previous, loaded with goods for Montana. Sioux City is 1,040 miles above St. Louis, so that precisely that amount of precarious steamboating is saved to the Montana trade.

An English inventor has patented the following simple plan for casting ingots of steel or other metal to any given weight. For this purpose the ingot mold is placed upon the table of a weighing machine, or upon a table supported by a spring balance; the ingot mold and everything in connection with it, is then weighed. By adding the weight of the ingot to be cast to the weight of the ingot mold and its accessories, he is enabled to make the ingot of any given and desired weight.

The directors of the Union Pacific Railroad Company have decided definitely upon the location of the great suspension bridge across the Missouri river. The point selected is where the line of the old Missouri and Mississippi railroad strikes the river, directly between the cities of Council Bluffs and Omaha. The estimated cost of the bridge is over $2,500,000, and its construction makes Council Bluffs the great railroad center of the West, much to the disgust of other competing towns, who earnestly desired the important position as the great distributing point for the eastern trade.

The Pacific Mills, of Lawrence, began operations in 1853. They now contain 100,000 spindles for cotton, with carding, picking, and cleaning machines, 16,000 spindles for worsted goods, and 18 printing machines. The machinery is driven by eight turbine wheels, two of which are 84 inches in diameter. The weekly production of goods is about 700,000 yards, and the sales about 7,500,000 per year. The company are now employing about 3,000 hands.

An oil establishment at Moabit, near Berlin, Prussia, by means of the bisulphide of carbon, are daily extracting six thousand pounds of oil, of sufficiently good quality to be employed in lubricating machinery. Colza and linseed are the materials employed, the residue serving well to feed cattle with. Analysis has shown that only 2 per cent of the oil and 7 per cent of water remain after this new mode of treatment, while the residues of the ordinary pressure powers, contain 9 per cent of oil and 15 per cent of water.

The plumbago mines of Canada are represented to be one of the most important of the mineral productions which the new Dominion possesses. Several companies are conducting operations on an extensive scale in the county of Ottawa, and many others will be organized the coming season. The extent of the plumbaginous deposits in the crystalline rocks is said to be very large; the deposits, however, are intersected in some districts with a calcareous formation, from which the plumbago is not easily separated. Plumbago finds an employment in the various arts and manufactures to a far greater extent than is commonly supposed, the cities of Boston and New York alone consuming upwards of ten thousand tuns annually. Hitherto, the greater part of this supply has been imported from Germany and Ceylon, but the time may not be far distant when the Canadian mines, will fully supply the entire American market.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

DOUBLE DRAWBRIDGE.—T. S. Speakman, Camden, N. J.—In this invention the bridge is widened at the draw and provided with two tracks or ways across the channel, so arranged and operating that a vessel passing the bridge cannot for a moment obstruct the travel across it.

COMPOSITION FOR COVERING WOODEN BRIDGES, BUILDINGS, ETC.—J. Heckel and Michael Eichinger, Decatur, Ill.—The object of this invention is to protect wooden structures from fire, and to preserve them from decay, resulting from the action of the weather, moisture, etc.

PORTABLE GAS GENERATING APPARATUS.—Wm. M. Sloan, Buffalo, N. Y.—This invention consists, first, in providing within the carbureting chamber a floating vessel having a felt bottom, for the purpcses hereinafter shown and, secondly, in heating steam or air that has been carbureted, and thereby fixing it as a gas.

DEVICE FOR MOVING CARS.—J. Douglass, McConnellstown, Pa.—The object of this invention is to furnish a cheap, durable, and convenient portable instrument, by which heavy cars can be started and moved along the track by hand without difficulty, whether the track be inclined or level.

PORTABLE HEAD REST FOR RAILROAD CAR SEATS.—R. W. Haywood, Baltimore, Md.—In this invention a hinged adjustable standard which supports the cushion or head rest is so operated by a regulating screw that it can be made to assume any position in relation to the back of the seat, which may be most convenient for the person occupying the seat.

WELL TUBE.—Wm. Martin, Tarr Farm, Venango county, Pa.—In this invention the point has two ears by which it is attached to the upper part of the tube, the latter having a longitudinal slot under the ears through which it is riveted to them. While the well tube is driving into the ground, the lower end of the cylindrical tube steps in a socket in the upper end of the conical point; and when the well has been sunk to the required depth, the upper part of the tube is raised so as to allow the water to enter.

HORSE COLLAR.—Ira Houghtling, Houghton, Mich.—This invention relates to an improvement in horse collars, and consists in forming the collar of india rubber, wood, or any other suitable material, with holes running through it from back to front, in any direction, to make it light and elastic.

COMBINED MUSICAL REED AND RETURN BALL.—John Burke, Brooklyn, N. Y.—This invention has for its object to furnish an improved toy for children, which shall be so formed as to combine two toys in one, without affecting the efficiency of either.

CONNECTING LINK.—Wm. N. Pelton, New London, Conn.—This invention relates to a new connecting link for chains and other purposes, and consists in the use of a link in which a portion is hinged to the body, and can be fastened with its free end by means of a pin to the same.

SOFA BEDSTEAD.—Julius Werner, New York city.—This invention relates to a new sofa which is so arranged that its seat can be folded out and that its back can be folded into the place of the original seat, so that thereby a bed bottom of double the width of the original sofa seat can be obtained.

CONVEYOR FOR GRAIN, ETC.—J. M. Rush, Marengo, Iowa.—This invention relates to an improvement in the construction of a conveyor for feeding grain into a set of millstones or an elevator, or for other similar purposes.

BALANCED SLIDE VALVE.—Wm. B. Robinson, Detroit, Mich.—This invention relates to a method of packing and balancing the slide valves of steam engines, whereby the pressure of the steam on the face of the valve is counterbalanced and the valve allowed to have a free and easy motion.

ADJUSTABLE VALVE ROD CONNECTION.—John Robertson, Quincy, Ill.—This invention relates to a method of connecting the valve rod of a steam engine to the eccentric band, whereby the rod may be adjusted to the proper length without turning it round or in any manner disturbing any of the parts connected with it.

COFFIN.—Samuel Avery and Lewis Delill, Phœnix, N. Y.—This invention has for its object the construction of wooden coffins in such a manner that they may be readily packed in a small space before being put together, and also so that the sides, or the parts of which the sides are composed, shall require no bending.

PAPER RULING MACHINE.—Wm. S. Wilder, New York city.—This invention has for its object to furnish a simple, convenient, and accurate paper ruling machine, for ruling bill heads, etc.

GANG PLOW.—W. F. Higgins and Jerome Perry, Watsonville, Cal.—This invention has for its object to furnish improved devices for connecting the plow frame to the sulky or wagon frame and for raising and lowering the plow frame and plows, as may be desired.

BAILING PRESS.—Enoch Taylor, Memphis, Tenn.—This invention has for its object to furnish an improved press for pressing or bailing cotton, hay, tobacco, etc., which shall be strong, durable, simple in construction, and effective in operation.

RULING PEN.—John H. Holland, Hancock, Mich.—This invention has for its object to furnish an improved ruling pen, so constructed and arranged that it may be adjusted to rule parallel lines at a greater or less distance apart, as may be desired, and so that the pens can be conveniently removed and replaced as required, without inking the fingers.

APPARATUS FOR HEATING APARTMENTS.—Felix Walker, Memphis, Tenn.—This invention relates to a new device for heating apartments, and consists chiefly in the use of an egg-shaped stove, set upon a hearth or iron plate which is on a level with the floor, the ashes falling through the plate into a pan arranged under the floor, or through a valve under the floor into any suitable receptacle.

CABINET BEDSTEAD.—Wm. Dutton, Philadelphia, Pa.—This invention relates to that class of bedsteads which are constructed so as to fold upward and be concealed from view when not in use, and present the appearance of a bookcase or other piece of furniture generally used in sitting or reception rooms. It consists in an improved manner of hanging the bedstead, whereby it may be counterpinned so as to require but a slight effort to raise and lower it. The invention further consists in a novel application of legs or supports to the bedstead, whereby the legs or supports will be automatically folded and unfolded by the raising and lowering of the bedstead, and in such a manner as not to interfere in the least with the application of the hands in manipulating the bedstead.

PORTABLE FENCE.—Charles Lee, Sandy Post-office, Ohio.—This invention relates to an improved fence, and consists in clamping the pannels between portable posts by means of blocks and keys, one or more, to each pannel.

EXTENSION CHAIR.—Bernhard H. Zinn, New York city.—This invention consists of a folding foot rest which is capable of being folded out of the way under the seat of the chair, and also of being raised or lowered to different hights when in use.

FISH CATCHING ATTACHMENT FOR VESSELS.—Thomas Bell, Bellport, N. Y.—This invention relates to a fish catching attachment to be applied to vessels, either steamers or those provided with sails. The invention is designed for catching those kinds of fish which swim near the surface of the water, such, for instance, as the mackerel and herring species, and which are caught in large quantities for selling or curing for food, the extraction of oil, and for manure.

LEMON SQUEEZER.—Thomas C. Smith, New York city.—This invention relates to a lemon squeezer, and is an improvement upon and designed to supersede the ordinary wooden squeezer provided with a porcelain cup or concave and a convex compress. The invention consists in having the body of the device of cast iron or other cast metal, and in the manner of applying the porcelain parts to the same, whereby a very desirable implement of the kind specified is obtained.

BRICK MACHINE.—Clinton Nolan, Niles, Mich.—This invention consists in so constructing the press that it can be lifted over a stone or any other obstruction; also, in so governing the press by a lever as to impart a greater or lesser amount of pressure according to the consistency of the mud; also, in so constructing a rack through which the clay passes before entering the mold or molds, with holes narrower at their center than at their ends in order that a larger amount of clay may be forced into the mold at its front end, producing a brick more equally and evenly pressed in all of its parts and causing the mold to be unevenly filled. Also, in so constructing and shaping the rack with an inclination from each side to the center as to afford the brick, when pressed, an easy egress from the machine. Also, a guide or turnpin for the mold inserting in the machine to strike against, so constructed and arranged as to be susceptible of adjustment for receiving a mold of a greater or lesser length, or to be adapted for the same molds as they become worn from use. Also in constructing the mold to a brick press with a movable bottom or follower.

TOP BOX OR BOARD.—David Wight, New London, Conn.—This invention relates to a box or board to be used for the playing of a game, which game consists in and is played by spinning a top that is made of an octaginal or other polyginal shape.

BRACELET.—Charles M. Kinsel, Columbus, Ga.—This invention consists in so constructing a bracelet of such class worn as an ornament or jewel upon the wrists of ladies, misses and other persons, that it can be folded up, or, in other words, brought to such a form as to be susceptible of being worn as a finger ring, if so desired, which form of bracelet is intended to be denominated for convenience in trade a "bracelet ring."

TATTING SHUTTLE.—E. N. Parker, Center Brook P. O. Essex, Conn.—This invention relates to improvements in an instrument used by females in fabricating a kind of trimming called "tatting."

CLOTHESPIN.—A. L. Taylor, Springfield, Vt.—This invention relates to an improvement in the ordinary wooded clothespin, those which are provided with rigid prongs formed by slotting a stick of suitable dimensions in a longitudinal direction. It consists in providing such class or kind of clothespin with a catch or fastening arranged or applied in such a manner that the pin will be effectually prevented from casually slipping off from the line and freeing the clothes therefrom, a contingency of frequent occurrence especially in windy weather.

LINING FURNACES.—B. A. Haycock, Richland, Iowa.—This invention relates to a method of lining the fireplace or furnace of stationary steam boilers.

FIRE ESCAPE.—Azariah Robinson, New York city.—This invention has for its object a ready means for lowering persons and goods from a burning building, thereby saving life and property. It is applicable to any building or dwelling but is more especially designed for large tenement houses which have a great number of inmates and the conflagration of which is almost invariably attended with loss of life and considerable property.

LEAD AND SLATE PENCIL CASE.—Thomas B. McCaughan, Memphis, Tenn.—This invention relates to a case for lead and slate pencils, and it consists in having a rod attached to a sliding band on the case and arranged so as to work within a conical or taper ferrule, placed on the end of the case and admit of being shoved or pressed against the lead or slate of which the pencil is composed so as to hold the latter firmly in position when adjusted for use

APPARATUS FOR RAISING SUNKEN VESSELS.—Count Arthur Dillon, Paris, France.—This invention relates to certain improvements in pontoons for raising sunken or grounded vessels and consists in constructing the pontoons with an internal cylinder having pistons by the action of which the displacement of the pontoon is augmented or diminished and thus the raising and sinking of the pontoons is effected; also, providing the said pontoons with ballast compartments having trap bottoms for discharging the ballast together with other devices perfecting the whole.

BEATER HAY PRESS.—J. W. Lockhart, Charlestown, Ill.—This invention relates to an improvement in the construction of a beater hay press, and consists in the arrangement of a drop beater in connection with a horse power and operated by means of a rope and pulleys.

PROCESS FOR EXTRACTING GOLD.—Rudolph d' Heureuse, San Francisco Cal.—This invention relates to a method of extracting and separating gold from the foreign matter, or particles with which it may be combined, and consists in subjecting gold bearing substances to the action of melted zinc.

MACHINE FOR PICKING HAIR.—Ernest Hoffstaetter, New York city.—This invention relates to a machine for picking hair and cleansing it from dust and dirt.

SAP SPILE.—Williston Conner, Rensselaerville, N. Y.—This invention has for its object to furnish an improved sap spile, simple in construction, effective in operation, and which can be manufactured and sold for a very small amount.

PLANERS.—Thomas Tostevin, Council Bluffs, Iowa.—This invention has for its object to furnish an improvement in the construction of the cutters and caps of planer heads, whereby the first cost will be diminished, less grinding will be necessary to keep them in order, and the efficiency of the planers will be increased.

BEDSTEADS.—Wm. L. Thomas, Middlebury, Ohio.—This invention has for its object to furnish an improved bedstead, so constructed and arranged that the head part of the bed may be raised much or little, to vary the position of the person lying upon the said bed, as desired.

STOVES.—Joseph Collins and John Knox, Conshohocken, Pa.—This invention relates to a method of constructing stoves, whereby they are rendered suitable not only for cooking, but for heating purposes.

STEREOSCOPE.—W. M. Kohl, Cincinnati, Ohio.—This invention relates to a stereoscope or stereoscopic box, and consists in a new and improved application of the lenses to the box, whereby the former may be adjusted in two different directions, in order to obtain a proper focal distance and to suit the width of the pictures. Also, in an improvement pertaining to the scene or picture holder.

DEVICE FOR CONVERTING MOTION.—M. M. Follett, Westboro, Mass.—The nature of this invention relates to a novel means of changing reciprocating motion into rotary motion, or rotary motion into reciprocating, and at the same time changing the relative velocities of the parts having the two different movements.

COMBS.—Josiah S. Dickinson, Essex, Conn—This invention consists in the combination of a detachable comb plate with a holder, whereby the former can be readily moved from the holder when dirty or broken, and a new comb plate affixed in the said holder instead.

MOP WRINGERS.—M. M. Follett, Westboro, Mass.—This invention relates to an improvement in mop wringers, whereby the same may be more readily adjusted to the pail or tub, and securely fastened to the same, and at the same time providing a ready means of detachment, so as to substitute one tub or pail for another.

STILT SKATE.—Wm. Jordan, Galena, Ill.—This invention relates to improvements in stilt skates, and consists in so constructing them that the elevated shoe is jointed to the vertical connection of the runner, and the support for the leg, in a manner to make a very convenient, light, and graceful stilt skates. In this improvement the foot piece of the skate is detached from the runner and elevated above the same by a jointed connection, and provided with vertical extensions for securing to the side of the leg nearly as high as the knee, whereby a very graceful, light and superior stilt skate is provided.

SAWING MACHINE.—John L. Knowlton, Philadelphia, Pa.—This invention relates to a machine for sawing timber, in straight, curved, or beveled form, and is an improvement on a machine for the same purpose patented October 20, 1863. The object of the present invention is to render the machine better adapted for the sawing of crooked or curved timber, such as is used for ship building, and while effecting this result, to obtain simplicity in construction, a greater facility of manipulation, and a less cumbersome machine than usual.

FANNING CHAIR.—Augustus R. Hobbs, Elizabethport, N. J.—This invention relates to a method of constructing chairs, whereby the same are convertible at pleasure into rocking or fixed chairs, and whereby a fan is made to rotate by the rocking of the chair, thereby greatly increasing the comfort of the occupant.

BREECH-LOADING FIRE-ARMS.—Charles H. Allsop, Middletown, Conn.—This invention consists in a novel manner of constructing the breech, and applying the barrels thereto, and in a peculiar fastening or catch for the barrels, whereby the piece may be loaded or charged with the greatest facility, and the parts rendered very permanent and durable.

HOT AIR FURNACE.—H. G. Burr, Minneapolis, Minn.—This invention relates to a method of constructing hot air furnaces for warming buildings, and it consists in an arrangement of vertical flues and tubes, and horizontal plates, whereby the heat radiating surface of the furnace is greatly increased.

FLUTE.—Theodore Berteling, New York city.—This invention relates to the supplying of the keys of flutes or similar musical instruments, with adjustable regulating screws, for the purpose of regulating the throw or lift of the keys. Where a note is required to be repeatedly played, the cushions on the lower surfaces of the keys are apt to become flattened, and the instrument is thereby caused to fail to sound according to the wish of the operator.

MACHINERY FOR THE MANUFACTURE OF GUNPOWDER.—Paul A. Oliver, New York city.—This invention relates to a machine for combining and incorporating the ingredients of which gunpowder is composed, and also for granulating or separating into small lumps the mass of powder compressed in cakey form, by the combining and incorporating of the ingredients. The object of the invention is to obtain an economical device whereby the above result may be obtained within a comparatively small compass, and one which will be continuous in its operation. The present Chilian mill which is now used for the purpose, being very cumbersome and expensive, and not continuous in its operation.

FISH TRAP.—Thomas B. McCaughan, Moscow, Tenn.—This invention relates to a device for catching or hooking fish, and is designed to be used in connection with a set line. It is a common practice with fishermen, in many localities, to bait hooks, and have the lines attached to a pole or rod sunk into the bed of the river or creek, or into the bank at the side of the same, the lines being visited at suitable intervals, and the fish, if any, be caught, drawn out of the water, the hooks rebated, and again thrown into the stream or creek. The fish very frequently succeed in taking the bait from the hooks of these set lines without being hooked, on account of the absence of any jerk or pull when they seize the bait; and the object of the present invention is to overcome that objection attending the use of set lines.

SAFETY LOCK FOR HARVESTER.—Stephen Hex, Orefield, Pa.—The object of this invention is to accomplish the instantaneous locking of a reaping or mowing machine, when the driver shall fall therefrom; and thereby prevent any injury to the driver from the cutters or knives of the machine. It consists of a pawl catch and lever for lifting the same from the teeth of the main gear wheel, with other devices perfecting the operation.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

TO CORRESPONDENTS.—Once more we ask the attention of our correspondents to the necessity of giving their name and address. Many letters require a reply by mail when answers to the inquiry will not probably interest a large number of readers, which we are unable to give when the signature is "Young Mechanic," "Constant Reader," etc. Nor can we direct to "Smithville," when there is no State given and there are fifteen postoffices in the country bearing that euphonious title. Careless correspondents need not expect attention paid to their letters. Neither will answers be given when the same inquiry has been replied to in correspondent column recently.

J. B., of Wis.—"I have now a 10 by 24-inch cylinder to my engine running 100 revolutions per minute with 100 lbs steam; have boiler enough to make steam freely. I am putting in a 12 by 24-inch cylinder which I propose to run at 90 revolutions with 75 or 80 lbs. of steam. Some affirm I shall not be able to get steam from the boiler at 75 lbs., and others that if I do get the steam, I shall not have the power the old cylinder yielded." Your engine with cylinder 10 by 24 inches at 100 revolutions with a pressure of 100 lbs. on the piston will give 95·2 H. P. The engine 12 by 24 inches at 90 revolutions and 75 lbs. of steam will yield 92·47 H P. The same cylinder with 80 lbs. on the piston will give 98·64 H P.

L. D. Y., of N. Y., thinks the proposals for a bridge between New York and Brooklyn cities should be made to the engineers of the whole country, the governments of the respective cities offering a certain sum, etc., for the best plan. We believe that the bridge company advertised for proposals which were open to all to answer, and that the company has already adopted the plan o John A. Roebling, which plan will probably be soon in process of execution.

N. G. G., of Nebraska.—"What would be the relative effect of equal weights attached to the periphery of pulleys of unequal diameter connected by a belt, say let one pulley be one foot in diameter and the other two feet?" There would be no difference in the power exerted by the weights if there was no slipping of the belt.

E. S. B., of N. Y.—"The best method of applying gold leaf to drawing paper or Bristol board for illuminated lettering." Gold leaf is applied to almost all substances by means of "size," easily obtained at any store for artists' materials.

M. C., of Ky.—The metal used for the body of an electrotype is common type metal. The shell or copper face of an electrotype is precipitated by electricity from a solution of sulphate of copper or blue vitriol, the metallic strength of which is maintained by a bar or plate of pure copper which is suspended in the solution and is connected by a wire with the negative pole of a galvanic battery.

J. McE.—"Is soapstone packing injurious to the piston rod of a steam engine? . . Where can I get an oil can like those used on locomotive engines?" We have never used soapstone packing, and cannot inform you as to its effect on piston rods. We judge, however, that its use would not be advantageous. Any railway supply store will furnish the oil can.

S. G. M., of N. Y.—Borax for welding or any other purpose is easily dissolved in water. So dissolved it is frequently used for welding iron and steel. As a paste it is as easily applied as when a powder.

C. C. H., of Ky.—In regard to the comparative merits of plowing and spading for agricultural purposes, we believe that practical men prefer the latter because of the better pulverization of the soil.

W. E. B., of Pa.—Sperm oil we consider preferable to other oils for use on an oil stone. We know of no ink in common use not in some measure injurious to steel pens. An acid is a component to the writing fluids generally used, which will attack steel. The best remedy against corrosion of the pen is to clean it as soon as it has been used.

J. R., of Ohio, and J. L. B., of Ky.—You can obtain parafine (not paraffine oil) to prevent oil from rusting at a petroleum refinery; or, in the form of paraffine candles at a grocery. It is the best substance for the purpose we know of.

T. S., of N. Y.—You will find nothing better for a mold for your brass model than common molder's sand, which you may obtain cheaply at any brass or iron foundery. Common sand will not answer the purpose.

L. B., of Mass., recommends plaster of Paris as a means of "chucking" articles to be turned or bored. The face plate should be slightly rusty and the article properly secured to it by bolts or any other means, and when true and in place, the plaster should be laid around the edge, uniting the piece to the face plate or chuck. It will hold the work firmly.

T. P. N., of Conn., asks "why there is no manufactory in this country for the finer qualities of porcelain ware. We have large deposits of kaolin of excellent quality, etc. Is there any work that shows by diagrams the machinery for this manufacture?" There are deposits of good material in this country for this manufacture, and the reason why they are not used is because they can be made in Europe to better advantage, labor being cheaper than here. The Cartlidge Porcelain Works at Greenpoint made beautiful ware some years ago but the enterprise proved unprofitable. We cannot give you the title of such a work as you desire.

W. Y., of Mo.—White wax may be colored red, blue, or any other tint by boiling ordinary dye stuffs in it and decanting the wax while fluid.

A. S., of St. Petersburg, Russia, asks how to deodorize barrels that have contained peninsular (petroleum) kerosene to make them fit for brandy or spirits. We have before replied to a similar question that we know of no effective process.

W. H. B., of S. C.—The advertising columns of the SCIENTIFIC AMERICAN will inform you of roofing paints which claim to make tin roofs water tight.

A. M. S., of Mass., desires to know how to cut small mirrors from the fragments of larger ones without injury to the reflecting amalgam which is invariably shattered on the breaking of the glass after cutting. We think it probable that a solution of albumen or rubber flowed over the amalgam and dried before cutting will be effective.

H. M., of Minn.—"J. W. H., on page 39, current volume asks if it will take more power to grind eight bushels of wheat in the same time on a four feet run of stone than on one of three feet. I think it will take less power to do the work on the four feet run, as the velocity required to make the smaller stone equal in capacity the larger absorbs a large proportion of the power." "Pallett's Miller and Millwright" can be obtained of H. C. Baird, 406 Walnut street, Philadelphia, Pa.

E. E. S., of N. Y.—"What is the easiest and surest way to make ordinary pencil manuscript indellible? Is there any chemical substance, powder, or solution which may be applied by passing a sponge or cloth once or twice over the writing with a certainty of securing the desired result? If so, what is it and where may it be obtained?" See "Answers to Correspondents," "A. F. T., of Wis.," page 231, current volume.

R. L. M., of Me.—Better advertise in our "Business and Personal."

J. A. W., of Ohio, says the feed water of his boiler contains a large proportion of carbonate of lime which incrusts the iron, and he has thrown the sawdust of his mill into the pool from which the boiler is fed, the effect being to change the color of the water and loosening of the scale. He asks if the sawdust (poplar wood) contains an acid injurious to the iron. We think not, or what it has will combine with the lime rather than attack the iron. The use of woods of various kinds to prevent boiler incrustations has long been known. Logwood is extensively employed for this purpose, and forms the basis of some of the popular patented anti-incrustation compounds. The utility of these woods to prevent incrustation is supposed to be due to the presence of pyroligneous acid, which dissolves the carbonate of lime and prevents its deposition. Chestnut, poplar, willow, and alder woods are richer in pyroligneous acid than logwood. Although destructive to iron, this acid is neutralized by the carbonate of lime, so that a boiler will be kept clean and suffer no injury unless too much acid is present. A small quantity of sawdust in a boiler is usually sufficient to keep it clear of carbonate of lime deposits.

T. H., of Ohio.—If you wish to ascertain whether centrifugal motion affects gravity it may be done by suspending two equal weights to the two ends of a cord and tying the middle of the cord to the hook of a spring balance. Weigh the suspended balls when at rest, then twist the cords together tightly and allow the weights to fly apart and while they are performing their circular motion note the variations of the index of the balance.

J. P., of R. I.—We believe no solder has yet been made which will permanently unite pieces of aluminum bronze.

"Subscribers," North Adams.—"Water is brought into this place from a fountain. It is carried in an iron pipe of 6 inch caliber down grade about half a mile, falling say 75 feet, then goes up grade about half as far, rising some 40 feet. Then it goes down again on 20° inclination about 60 feet; then over undulating ground half a mile. At the 60 feet summit the 6-inch pipe stops and one of four inches diameter is laid. Of course it cannot receive the water from the 6-inch pipe. 1st. How far should the 6-inch pipe go over the hill to have the increased velocity of the water so lessen the volume as to have it enter the 4-inch pipe without any obstruction? 2d. How much more water would pass through the 6-inch pipe by passing around the 60-feet rise than by passing over it? 3d. What would be the difference in the quantity of the water if it were discharged before it began to rise the first hill and the quantity that would pass over the hill?" We apprehend that the difficulty alluded to in the first question might be overcome by a joint pipe of suitable length, tapering from 6 inches diameter on one end to one of 4 inches on the other extremity. The arrangement proposed in the second question would not affect the obtainable supply at all. The third question you can best answer yourselves bear in mind that the amount of water flowing from an opening will in this case depend on the area of the cross section of the opening, its perpendicular distance from the level of the fountain, and the pressure under which the column of water issues from the fountain.

C. S., of Mass.—Look through a file of the SCIENTIFIC AMERICAN and you will find full particulars about the properties and manufacture of gun cotton. We cannot afford the room to reply to individual inquiries on subjects that have been repeatedly answered in this column.

Business and Personal.

The charge for insertion under this head is one dollar a line.

The surest detective of low and high water, and high steam in boilers yet invented. Springer, Hess & Co., Philadelphia, Pa.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, Pa., has just published "A Practical Guide for Puddling Iron and Steel." By Ed. Urbin, Engineer. A prize Essay read before the Association of Engineers, graduate of the School of Mines of Liege, Belgium. To which is added a comparison of the resisting properties of iron and steel. By A. Brull. From the French, by A. A. Fesquet. 8vo. $1. By mail free of postage.

Capital wanted to extend the manufacturing facilities of one of the established best family sewing machines now sold. Address "Proprietors," box 1442, New York Postoffice. Or would contract with a desirable manufacturer.

There are now in actual operation eight thousand of Ashcroft's Low-Water Detectors. John Ashcroft, 50 John st., New York.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Parties wishing to Manufacture the Hoilen Knitting Machine on royalty, or who would supply a Company with machines, address Todd & Duncan, Bellefonte, Pa.

Henry Carey Baird, Industrial Publisher, 406 Walnut st., Philadelphia, has just issued a new and much enlarged descriptive Catalogue of Practical and Scientific Books, 56 pages, 8vo, now the largest list of this character, comprising only the Publications of any one house in either the United States or Great Britain. It will be sent free of postage to any one who will favor him with his address. Every reader of the Scientific American is invited to send for it.

Coal-oil Works, revolving retorts and refinery, lately erected, for sale. Address, on the premises, John White, Darlington, Beaver Co Pa., or C. G. Waterbury, 116 Wall st., New York.

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

To insure the safety of your steam boilers, property, and life, apply Ashcroft's Low-water detector. John Ashcroft, 50 John st., N. Y.

For Improved Lathe Dogs and Machinists' Clamps, address, for Circular, C. W. Le Count, South Norwalk, Conn.

Bartlett's Reversible Sewing Machines are the lowest priced reliable machines. Are used by hand or foot. 569 Broadway, N. Y.

Black Gypsum—where can it be found in quantities so as to be worked? Parties that can furnish the article address E.E. Hendrick, Carbondale, Pa.

Paper Makers, Tanners, etc., wanting the Best and Cheapest Pump in use will send for Circular to Heald, Sisco & Co., at Baldwinsville, N. Y. Agents wanted.

Parties desiring the best Molding Machines in the market, should address H. A. Lee, Worcester, Mass.

Wanted—the address of Plow makers, out of New England, who would like to introduce, without risk or advanced expense, the best Plow in the market. Address Solomon Mead, New Haven, Conn.

Manufacturers of Iron Pipe and Hydrants please send weight, prices, etc., to G. W. Pearsons, Ogdensburgh, N. Y.

For Sale—A Toy Engine with copper boiler. Price $13. For Photograph and description, send 25c. to Box 597, Gloucester, Mass.

Paper Collar Machine, Improved Style. Also, an improved Machine for plaiting linen and Cotton Bosoms, at the cor. Union and Fulton sts., Troy, N. Y.

Manufacturers of soda water apparatus send circular to box 179, Cape Vincent, N. Y.

Makers of spring movements, for running light machinery, address, stating terms, etc., C. King, 1 King's Place, Albany, N. Y.

C. De P. Field, No. 21 E. 26th st., wishes the address of the maker of the electric lamp recently noticed in these columns.

$500 will be paid for a method of coating large chill rolls, which, upon trial, will be found to overcome the danger of breakage in casting. Address Lock Box 304, Pittsburgh, Pa.

Inventors or manufacturers of machinery for making wrought flap and strap hinges will please address X. Y. Z., Lock Box No. 236 Providence, R. I.

Wanted—A model shuttle sewing machine, to serve as a model for making a cheap shuttle machine to be run either by hand, or with table and treadle—to be manufactured in a foreign country. Address Amos C. P. Poncier, Boston, Mass., describing machine and stating terms, etc.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, has just published:—"Painter, Gilder, and Varnisher's Companion: Containing rules and regulations in everything relating to the arts of painting, gilding, varnishing, and glass staining, with directions for graining, marbling, sign writing, and gilding on glass. To which are added complete instructions for coach painting and varnishing. A new edition 12mo, cloth, $1 50. By mail free of postage.

EXTENSION NOTICES.

George A. Leighton, of Lawrence, Mass., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in sewing machines, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday the 22d day of June next.

Henry Outcalt, of Wilmington, Ohio, having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in mode of constructing metallic roofing, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Jonathan Ball, of Elmira, N. Y., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in mode of connecting water pipes, for seven years from the expiration of said patent, which takes place 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next

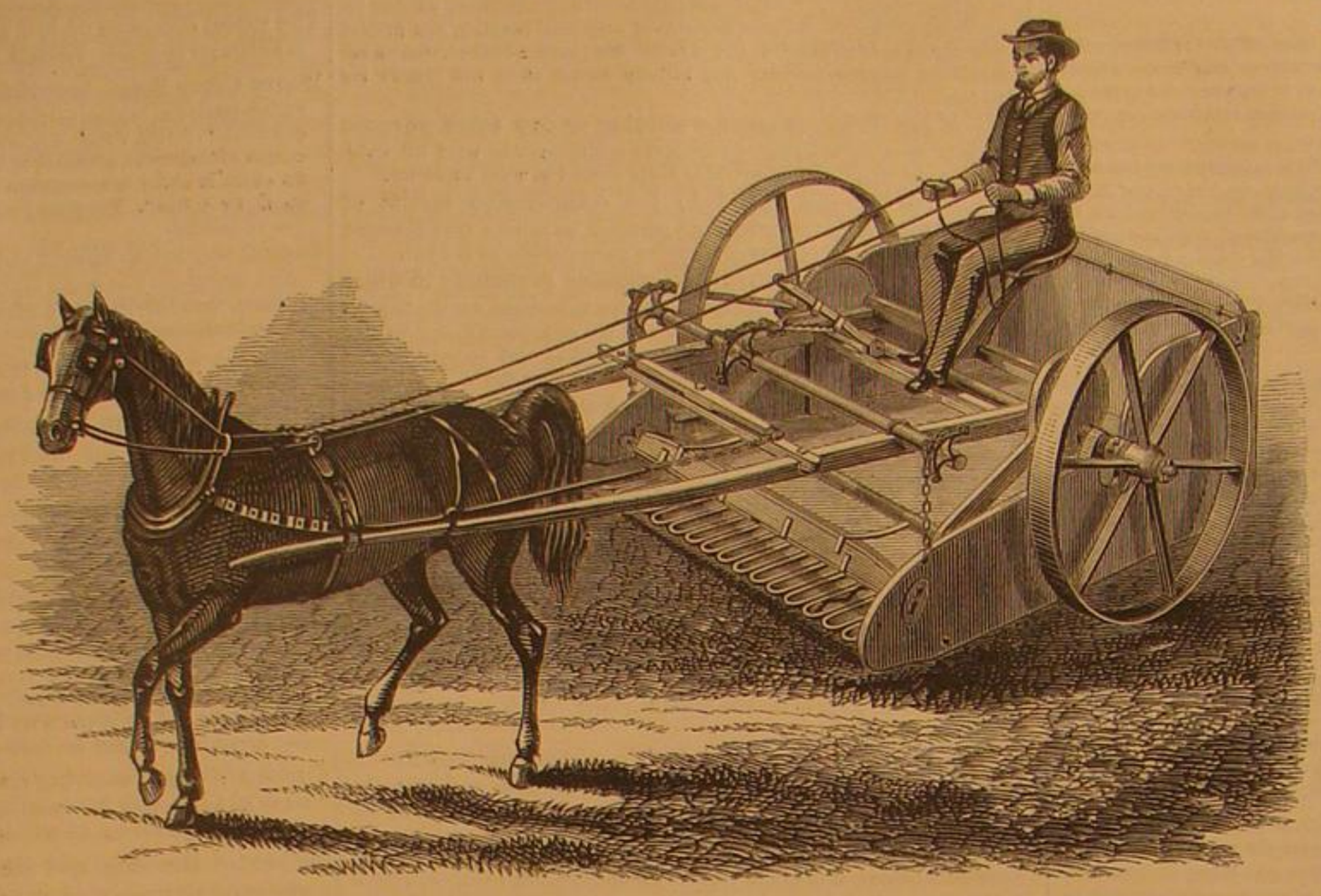
Device for Harvesting Clover Seed.

Since the introduction of mowing machines they have been applied to other than their legitimate or primary purposes, with good results in most cases. But for some purposes, a different machine is preferable. The grain cradle and the hand scythe have become almost things of the past. For harvesting clover seed, however, they are better than the mowing machine; but the simple implement shown in the accompanying engraving is specially adapted to this work. The labor of mowing clover and collecting seven or eight tuns of straw for the small amount of seed for which the work was performed, is useless, and improvident; for the straw or stalks should be left on the land for the protection of the roots during the winter and for the enrichment of the soil.

The machine herewith illustrated removes only the heads of the clover, leaving the straw, where it should be, on the ground. It will not collect a particle of other seed, such as that of the ragweed—a great pest to farmers—but takes only the seed heads of the clover. The action of the mowing machine or of the scythe jars the seeds from the heads, when they are fully ripe, wasting large amounts of the former, which waste is greatly enhanced by after handling. This machine, however, collects all the seed on the site of its growth without any waste whatever.

It may be drawn by a single horse, driven by a boy, the forward movement of the machine giving motion to the gatherer, while a reverse or backward motion has no actuating effect, the driving wheels being connected with the shaft by spring ratchets. The front of the machine is a series of semi-cylindrical fingers, concave on their upper surface, for the reception of the heads, a traveler having a reciprocating motion by means of eccentrics, cranks, or other suitable device, passing over the fingers from front to rear, throwing the seed heads back into the body of the machine as it moves forward. To facilitate this delivery a plate on the under side of the traveler receives a transverse oscillating motion by means of pins engaging with zigzag slots in one, two, or more of the fingers, by which the heads of clover are effectually thrown back from the fingers into the body of the vehicle. A simple device of drop latches or cams raises the traveler above the fingers on its forward stroke and allows it to slide closely over their tops on its backward movement. An elevating bar in front and on one side of the driver enables him to graduate the hight of the gatherer to the hight of the clover. From the foregoing any practical farmer may readily understand the construction and operation of this machine.

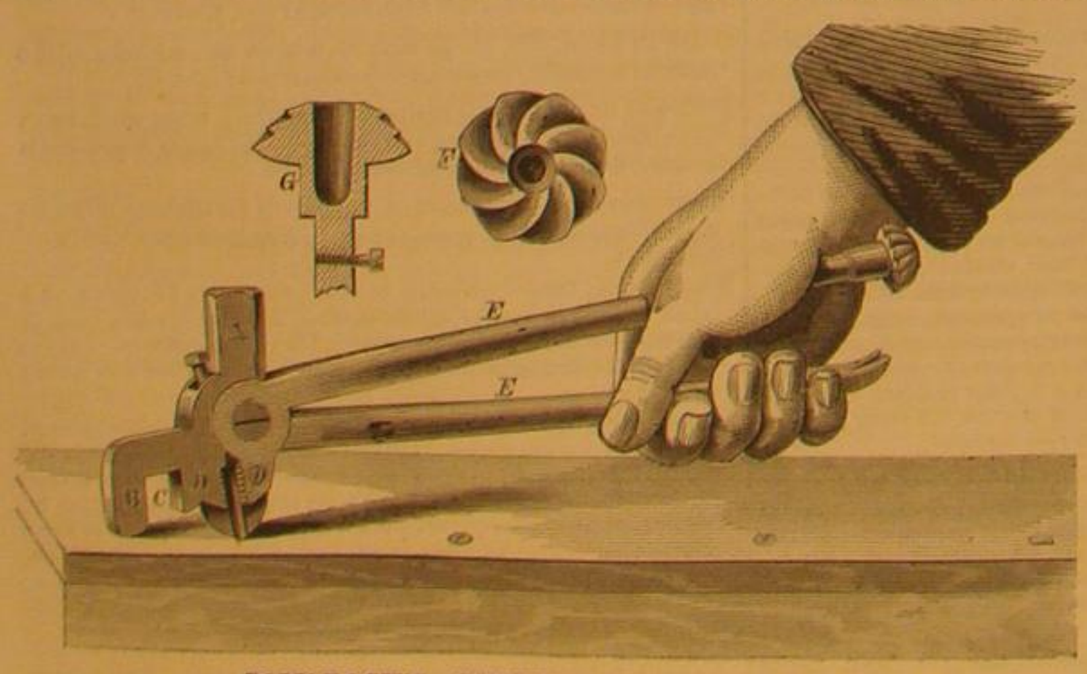
Patented through the Scientific American Patent Agency, Feb. 25, 1868, by S. L. Stockstill and Wm. H. H. Scarff who may be addressed for rights, etc., at Medway, Ohio.



STOCKSTILL & SCARFF'S PATENT CLOVER SEED HARVESTER.

Improved Combination Hammer, Nail Drawer, Forceps, etc.

The tool which the engraving represents is one of those implements which are intended to combine the offices of various separate tools, and which are so much affected by our inventors. In one implement is combined a number, the whole combination being light, portable, and handy. It is a tool which will find a place of usefulness in the shop of the mechanic, the home of the farmer, in stores where boxes of goods are to be opened, and in almost every place where mechanical work is performed.



COMSTOCK'S COMBINATION IMPLEMENT.

Its construction is similar to that of the forceps, tongs, or pliers, A being a hammer head; B, a fulcrum; the space, C, a wrench; D, corrugated jaws for grasping and drawing nails; and E, the handles or levers. At the end of one of the handles is an ordinary claw for drawing tacks, etc., and the end of the other may be formed into a screwdriver, or, as shown in the engraving, may receive a hollow burr for cutting away the wood when the nail-head it is desirable to reach is imbedded in its substance. Face and sectional views of this burr are seen at F and G, the screw in the latter showing the mode of attaching the burr or screwdriver to the handle. A hole through the head of the implement is sufficiently large to allow the passage of a nail up through, as seen in the engraving. It is suited to nails of all sizes. The operation and use of the implement is plainly shown in the engraving. It will be seen that the upper lever of the tongs is a bell crank, the short arm being one of the jaws, which, when open, projects below the fixed jaw, and may be easily driven into the wood on one side of a deeply imbedded nail, when the construction of the handles will bring the fixed jaw down to the level of the point of the movable jaw, and thus secure a gripe which will securely hold and easily draw the hardest nail.

Patented through the Scientific American Patent Agency, March 3d, 1868, by T. C. Comstock, who may be addressed at Harrodsburg, Ky., for further information.

An Universal Genius.

Engineering publishes the following, which reminds us of a correspondent who closed a letter, describing a new invention, addressed to this office, not long since as follows: "I am an inventor, a farmer, repair watches, and practice medicine on week days, preach the holy gospel on Sundays":—

"Colin Pullinger, Selsey, near Chichester, contractor, inventor, fisherman, and mechanic, following the various trades and professions of a builder, carpenter, joiner, sawyer, undertaker, turner, cooper, painter, glazier, sign painter, wooden pump maker, paper hanger, bell hanger, boat building, clock cleaner, locks repaired and keys fitted, repairer of umbrellas and parasols, mender of china and glass, net knitter, wire worker, grocer, baker, farmer, stuffer and preserver of the skins of birds and insects, copying clerk, letter writer, accountant, surveyor, *engineer*, land measurer, house agent, vestry clerk, assistant overseer, clerk to the Selsey Sparrow Club, clerk to the Selsey police, assessor and collector of land tax and property and income tax, collector of church and highway rates; has served at sea, in the four quarters of the world, as seaman, sail maker, cook, steward, mate, and navigator. The maker and inventor of the following: an improved horse hoe, an improved scarifier, a newly invented couch grass rake, a machine to tar ropes, model of a vessel to cut asunder chains put across the mouth of harbors, a curious mouse trap, made on a scientific principle, where each mouse caught resets the trap to catch the next, requires no fresh baiting, and will catch them by dozens. Also, a mouse trap on a most novel, ingenious, and simple construction, being perpetually set, the bait will last for months; every mouse enters the trap through the same opening, and is most effectually secured, first on one side, the next on the other, and so in succession, catching any number; both traps being equally good, he leaves the public to decide which they consider best. A rat trap on a peculiar construction, that will catch and put them into the trap. An improved mole trap, model of a steamboat of quite a new and very improved construction, 4 ft. long, and challenged to beat any boat of the same length in the world. Crabs, lobsters, and prawns sent to any part of the world. Mouse and rat traps let on hire at one penny per week. If you doubt me, try me."

What is Power?

The word time means duration, nothing more and nothing less. The word distance means length, extension, nothing more nor less. But the word speed or velocity signifies both distance and time, that is, it involves both, for we cannot define nor conceive of speed without a given distance in a given time. Now the word power involves them all with the addition of pressure, that is, distance, time, and pressure, for we cannot define nor conceive of power without a given pressure, distance and time, or pressure and speed. Nor is it a compound word in its etymology, like *bene* or *male* or *vale*, but though a single term it has a compound and comprehensive and rather complex signification. Pressure, one of its constituents, is not simply weight pulling toward the earth by gravity, but also force pressing from the earth as by my hands holding up the book against gravity, and pushing along a wheelbarrow horizontally; in a word pressing any way in any direction. Power then consists of pressure and speed, *id. est.*, a certain force pressing a certain distance in a certain time, in the computation or estimate of which each one of these elements is equally essential. Then to ascertain the power of any engine we have only to multiply the pressure, which we express by pounds, into the speed, which we express by feet and minutes, and divide by whatever standard we adopt or wish, to bring it to a practical expression.

S. S. Rembert.

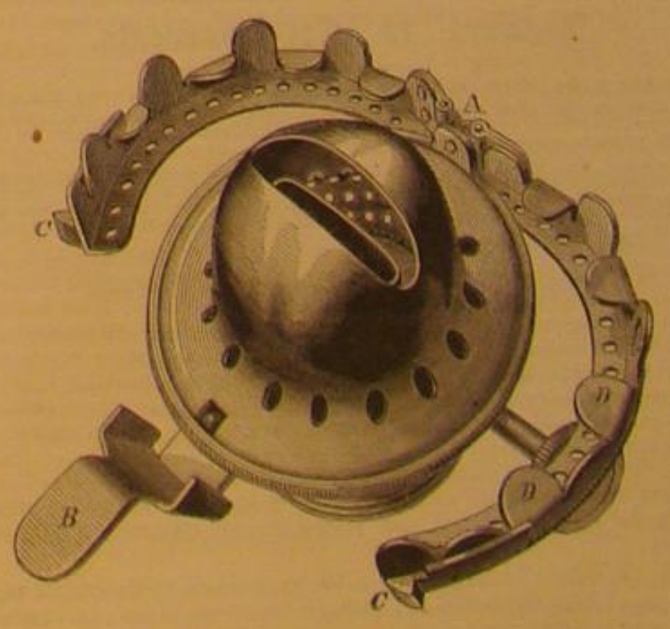
Composition for Sharpening Edge Tools.

This composition is intended for use in sharpening edge tools, being formed into the usual shape of whetstone or grindstone, and used in the same manner. It is formed by taking potter's clay and mixing thoroughly therewith about one half the quantity thereof of finely ground flint, using therefor the refuse material rejected in the manufacture of sand paper, as being too fine for that use. The mixture is wet, and then molded into any desired form, and then baked. The peculiar consistency of the potters' clay is such that it will not glaze in use, and the particles of fine flint will sharpen the tool applied thereto. Patented by George L. Witsil, of Philadelphia, Pa.

ROUP'S IMPROVEMENT IN LAMP TOPS.

Those kerosene lamp tops on which the glass chimney is held by means of a screw frequently break from the expansion of the glass by the heat of the flame if the screw is set up against the glass, and if the screw is not closely set up the chimney rattles if the lamp is moved, or perhaps falls off. Those also which hold the chimney by a spring frequently get out of order by the relaxation of the tension of the spring. To overcome these annoyances is the object of this improvement.

The top is of the usual form, but the rim that holds the flange of the chimney is in two parts, hinged as seen in the engraving at A, and held when closed by the spring, B, and catches, C. When open, as in the illustration, the chimney is placed on the lamp top and the two semi-circles brought together and fastened by the spring. The bent snugs, D, overlap the flange of the chimney and when the glass becomes heated they yield sufficiently to its expansion to prevent it from breaking. Preliminary steps for securing a patent have been taken through the Scientific American Patent Agency by the inventor, T. T. Roup, of Greencastle, Ky.



It is better to correct a defective journal than to waste the oi which will lubricate half a dozen bearings which are in line

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN. S. H. WALES. A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York

☞ "The New York News Company," 8 Spruce street

☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents or the SCIENTIFIC AMERICAN.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XVIII., No. 17....[NEW SERIES.].. *Twenty-third Year.*

NEW YORK, SATURDAY, APRIL 25, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improvement in Knitting Machines 257
New Facts in Acoustics..... 257
Lofoden Norwegian Cod Liver Oil 257
Sweets, and their Manufacture.... 258
Across Mt. Cenis—Fell's Mountain Railway 259
Correspondence of the Sun with the Clocks 259
Steam Temperature and Expansion 259
House Fly Parasite 259
Potassium and Sodium in Manures 259
Self-adjusting Telegraph Magnets 259
Rattlesnake Poison—Its Antidote. 260
Vaccine Virus—Innoculation for Small Pox..... 260
*Royal Institution 260
Marine Paint..... 261
*Clarke's Patent File for Papers, Music, etc..... 261
Consumption and its Cure..... 261
Effects of Light on Vitality..... 262
Manufacturing, Mining, and Railroad Items..... 262
Recent American and Foreign Patents..... 262
Answers to Correspondents..... 263
Extension Notices 263
*Device for Harvesting Clover Seed..... 264
*Improved Combination Hammer, Nail Drawer, Forceps, etc..... 264
A Universal Genius 264
What is Power..... 264
Composition for Sharpening Edge Tools 264
*Roup's Improvement in Lamp Tops..... 264
Screw Threads and Bolts—A Uniform System..... 265
The Hanging and Care of Shafting 265
Aluminum Bronze 265
The Wheel Question.....265, 266
Obituary—George Bartlett, Esq... 265
Patent Claims 266, 267, 268, 269, 270
Pending Applications for Reissues 270
Inventions Patented in England by Americans 270

SCREW THREADS AND BOLTS---A UNIFORM SYSTEM.

We have received a circular signed by Chief Engineer Theodore Zeller, U. S. N., President of a board of United States Engineers appointed by the Secretary of the Navy to examine and report upon the "various systems of screw threads in use by the principal manufacturing establishments in the United States, with a view of recommending a uniform system for general adoption." The circular asks for counsel and views upon the subject. The commission is to meet at the Philadelphia Navy Yard. Time not specified. We have repeatedly in these columns urged the advantages of a uniform standard for the dimensions of bolts and the grades of threads and recommended that of Mr. Edward Lyman of New Haven, Conn., whose system was endorsed by the Franklin Institute of Philadelphia and, we believe, has been adopted by several manufacturing firms. While we recommended the Lyman plan as the best we knew and far better than the no system at present in vogue, yet we believe it may be susceptible of improvement in some respects. In his plan the diameter of bolt head and nut is precisely the same, which seems to be an unnecessary waste of material. The head is, with the cross section of the shank or bolt proper, a solid, while the nut is pierced through its center by a hole equal to the diameter of the bolt. It is evident that the same amount of stock, considered in the cross diameter, is not necessary in the head as in the nut. To be sure Lyman makes his nut thicker than the head; this is correct, but we cannot see any reason for preserving the diameter of the nut for the head except, perhaps, keeping a uniformity, which if intended for the eye alone, is frequently useless, as from the relative position of head and nut one of them is effectually hidden in many clasess of work.

Lyman's form of thread is a V-thread of sixty degrees—the the angle of strength—the top and bottom of the thread being flat, and this part being in the proportion of one-eighth of the pitch. Thus there is no sharp angular nick in the substance of the bolt, which is always an invitation to fracture. Such a thread has no more tendency to "ride" or "strip" than any other, and is superior in the former respect to the round thread, affected by some mechanics. The Lyman thread will also save much annoyance caused by the breaking of the point of the screw cutting tool as in cutting the ordinary V-thread; there is also less danger of battering such a thread. On the whole, probably the commission cannot do better than to adopt this form of thread, whether they follow Lyman's grades or not. If a standard can be generally adopted it will prove of vast advantage to mechanics all over the country.

We have now in use in this country the Woodworth system and Holzapffel's, neither of which we believe has attained much popularity. Besides these, those concerns which do not adopt any particular standard become a "law unto themselves" and make and use their own plans. Possibly some of them contain valuable points which would aid in the establishment of a uniform system. We believe that in the addition to the foreign standards we have mentioned, one firm, celebrated for its accuracy in gages, etc, has attempted to inaugurate a system of screw threads and bolt sizes in this country. Of its merits we are unable to speak understandingly, not having a coppy of their diagrams before us. No doubt the commission to meet in Philadelphia will have plans enough submitted to them to confuse, if not to enlighten. We need, however, a national system of measures for screws, as we can hardly hope for one which shall meet equally the approbation of the mechanics and engineers of this and other countries.

THE HANGING AND CARE OF SHAFTING.

We believe there is less care bestowed and less sound judgment exercised upon the hanging and after care of shafting than upon any other means used in applying power to manufacturing processes. If the water wheel or the steam engine is in good order, performing its work properly, and the machines driven by it are also in good order, not a thought is bestowed upon the media between the actuating power and its ultimate development, except the necessary attention to the belts and the oiling of the shaft journals. Yet it is frequently the case, when the result is not satisfactory, that neither the driving power nor the machine which furnishes the product is at fault, but, if the result is not adequate to the cause, the reason may be found in the shafting or other intermediate transferrers of the power. Generally, in such a case, the belts are examined and their condition assumed as a reason for the imperfect transmission of the power from the prime mover. The condition of belts is a very important point in all manufacturing processes where power is used, and attention to them will save many dollars in the course of a year; but there are other as important elements, which are not always taken into consideration. One, and the principle one, is the condition of the shafting. A line of shafting running perfectly true, without jumping or jerking, turning smoothly and noiselessly, is a delight to the mechanical eye. The first thing examined by a thorough mechanic when he comes into a manufactory is the shafting. If the line runs true and the pulleys do not "wabble," the boxes do not exude oil at their ends, and there is no rattling or grinding, he says at once, "whoever hung this shafting knew his business."

A building for the reception of machinery should be erected with a view to its intended use. The walls and their foundations should be strong and rigid, and the timber sound and well seasoned. Fragile frames of imperfect lumber standing on insufficient foundations are costly receptacles for machinery. Shrinking and springing timber and settling walls cannot give the necessary support to the machinery, nor allow the reduction of friction to its minimum. In such rattle-traps a line of shafting will not retain its place twenty-four hours consecutively; a large proportion of the power employed is lost in overcoming unnecessary friction, and the running machinery rapidly deteriorates. When the amount of loss of power by friction exceeds twelve per cent there must be a "screw loose" somewhere.

But the reason of unsatisfactory running of shafting is not always its location in an improperly constructed building; sometimes those who hung it did not know, or, at all events, did not do their business. It is one of the most delicate jobs of the millwright and requires not only experience and skill, but discretion and good judgment. Where the shafting is supported by bracket boxes on posts a chalk line should be stretched and marked on the posts to represent the top and bottom of the brackets or the center line of the shaft. The sag of the cord, if the line is long, should be rectified by the eye aided by a water level or similar adjusting instrument. A wooden straight-edge of well-seasoned board, long enough to reach from one box to the next, and of uniform width is useful for leveling up the boxes. It is to be used on edge, one edge resting in the boxes and the spirit level placed on the other. Some millwrights provide themselves with iron cylindrical pieces of difierent diameters to fit various sizes of boxes, turned true and having a small hole drilled accurately through the center. These pieces are about six inches long and being laid in the box the cord is passed through the hole and stretched over three or four lengths of shafting. In practice however, we have preferred the straight-edge, which is rigid and offers a support to the spirit level. After all, the mechanical eye is the best test of line, although not of level.

When hangers are used the chalk line should mark the center of each hanger or a line directly over the center of the shaft. The flooring beams to which the hangers are to be secured, if of unequal depth or thickness, as is frequently the case, should be dressed to a level. Where shims are necessary they should be of rigid wood, well seasoned. We never found anything equal to rived cedar (not pine) shingles, which are almost as hard as horn. The bolt heads for suspending the hangers ought to be of flattened convex form, upset from the bar, and perfectly sound. A goodly sized washer should be inserted under the head and recessed into the floor. Where it is necessary to place a hanger directly to the floor planks, there should be a piece of seasoned plank, at least twice as long as the spread of the hanger legs, firmly bolted to the floor, on the under side of course. Some prefer lag screws or coach screws to bolts for securing hangers, and to say the truth, their hold is exceedingly tenacious; we never knew one to draw. The hole for their reception, however, should not exceed in diameter the size of the screw, less the thread.

One common fault in hanging shafting is spreading the hangers or brackets too far apart. A length of shafting should not be so insufficiently supported as to sag in the slightest degree; if it does it will spring when in motion and create a large amount of friction in the boxes. The hangers should also be located with reference to the weight supported on the shaft; a heavy pulley, or one, the belt of which sustains a great strain, should be supported by a box or boxes in close proximity. To accomplish this it is of course necessary that the position of every machine should have been determined before the shafting was hung; a competent millwright can do this; one that cannot make a plan and carry out its details is incompetent.

The shafting properly hung and the machinery in operation, the line should be inspected once in every two or three weeks, the hangers or brackets adjusted, if out of line, and every defect remedied. This is necessary with the best hung shafting and in the best building, if the economy of power is worth looking after; for there are so many disturbing causes affecting the integrity of a line that it is impossible to depend upon long continued accuracy unless constant attention is given to the condition of the shafting. A box slightly out of line or level will absorb a large amount of oil yet be continually hot, waste power by unnecessary friction, and grind and cut the shaft. Attention to these matters will be found to pay at the end of the year.

ALUMINUM BRONZE.

In treating of this new metal, one of the alloys of aluminum, we find ourselves indebted to the valuable writings and experiments of scientific men of Europe. We say Europe because this metal, comparatively unknown in this country, has not received much attention from our learned men. Its invention is a disputed subject between France and England, the former claiming the honor for St. Claire Deville and Debray, and the latter country naming Dr. Percy as the inventor. At that time many eminent men of both countries had their attention turned toward aluminum and its alloys so that it is highly probable that both can claim equal shares of the honors. The only alloy of this metal which shall receive our attention is that of ten per cent of aluminum with ninety per cent of copper. There are many others excellent for the purposes to which they are applied, but which do not possess the qualities requisite for mechanical purposes of that above named. Strength, elasticity, resistance to friction and oxidation, are among its peculiar attributes. Its strength approaches the average strength of cast steel, a statement which would sound improbable if not corroborated by experiments made by Mr. Anderson, Royal Gun Factory, Messrs. Simms, London, and Mr. Morin, Nanterre, where it was found that the tensile strength of this metal is of 5,328 kilogrammes to the square centimeter. At the same time a very important point was determined; the transverse strength or resistance to being bent. This was found to be for brass, 2·22, gun metal, 0·15, aluminum bronze, 0.05. That is to say, three equal bars of these different metals were fastened at one end so as to be perfectly horizontal, a certain equal weight was placed at the free end of each bar, and the result measured by an instrument for that purpose. Brass bent at 2·22 degrees of the instrument, the other metals as indicated above, thus showing the resistance of aluminum bronze to be 44 times greater than brass. The transverse strength, the resistance to permanent flexion, resistance to friction and the superior resistance to oxidation displayed by this metal, although the latter quality has not yet been accurately determined, admirably qualify it for delicate mechanism and also for purposes where hardened steel was entirely employed. The tenacity of this alloy is astonishing and is hardly equalled by any other metal; it is more difficult to cut than gold or brass but the cut is very clean and smooth. Further experiments, resulting very satisfactorily, were made to determine the resistance to compression or hardness of this metal by Messrs. Huguenin and Grossmann. These gentlemen have dwelt at length upon this subject, and have made careful tables, too long to insert here, showing the strength and elasticity of aluminum bronze compared with other metals; let it suffice to say that this new alloy possesses many of the qualities of cast steel and gold. When it becomes generally known, it is certain that it will inaugurate a new era in the manufacture of fancy metal work, replacing all gilt and gold plated articles, and thus open a new field to American industry.

THE WHEEL QUESTION.

This remarkable discussion continues to progress with unabated interest, and the letters still pour in upon us from all directions. We are seriously charged with having unfairly or prematurely dropped the subject from our columns, and are earnestly requested to reopen it. We have concluded to do so, in a manner that we trust will give general satisfaction, but without burdening the pages of the SCIENTIFIC AMERICAN. We propose to issue a special publication for the particular benefit of all the wheel philosophers, and we call their attention to the proposed terms and conditions, as set forth in another column. Let "The Wheel" be kept in motion.

OBITUARY.---GEORGE BARTLETT, ESQ.

Mr. Bartlett left this city on the evening of the 8th, to visit a sister residing in Providence, R. I. On the afternoon of the 9th, he laid down to recover himself from the fatigue of his journey, and shortly after he was discovered to be dead. Thus suddenly passed away a steadfast friend, a ripe scholar, and a zealous promoter of science and the arts.

Mr. Bartlett was for several years an editor on this paper, and in this capacity he won the high regard of all those who were associated with him. His contributions to the paper were remarkable for their clearness of expression and aptness of illustration; they were always entertaining as well as instructive. Many of his sprightly paragraphs have circulated through the newspapers all over the world. He had the ability from education and natural endowments of making his name illustrious in literature and science, and he lacked only the personal ambition. He printed very little over his own name, and thus his whole worth was known only to his intimate friends.

In his dealings with men he was always respected. He seemed wholly incapable of deceit. We believe he was truly an honest man

THE WHEEL QUESTION.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter? Answer, *One.*"

This discussion, instead of subsiding, has, like Vesuvius, now broken out afresh, and is having an excited run in various parts of the country.

We were lately advised that the learned Professor of Engineering in one of our largest northern colleges, had pronounced in favor of two revolutions. The same mail brought us an excellent essay from the learned Professor of Engineering in a prominent southern establishment, clearly showing that there could be but one revolution.

We are still in receipt by every mail of numbers of interesting letters, many of which are written with care, presenting new views and illustrations. Every one of them ought to be published, together with the stock of some seven hundred other letters upon the subject, that we already have on hand. But it is impossible, for want of space, to print them in the SCIENTIFIC AMERICAN, and, in order to meet the exigency, we have concluded to issue a special publication. We therefore hereby give notice to the wheel-philosophers, of whatever shade or grade, and to all lovers of scientific discussions, that on the 15th day of May, 1868, we shall commence the publication of "THE WHEEL," a Magazine of Science and the Useful Arts."

1. The work will be issued in monthly parts, handsomely printed with large types, large octavo pages, uniform with the Patent Reports, at 25 cents each number.

2. All persons who desire to take part in the wheel-discussion are invited to send in their communications, which will be published in the order of their reception, on the rule of "first come, first served." Those who have already sent letters will notify us if they desire to have them appear.

3. In order to meet the expenses of the "Wheel Question," each contributor will be expected to pay for the type setting and printing of his letter, which will be at the rate of $2.50 per printed page. There will be 56 lines on each page, and an average of 12 words to a line. The expense for diagrams will be extra, and will probably cost, if simple, from $1 to $3. The majority of the letters will not exceed half a printed page. Each contributor will thus be enabled to reckon the cost for himself, and the amount he will please remit to us at the time of sending his communication.

"THE WHEEL" will be continued in monthly parts so long as both ends of the financial department continue to meet.

Each contributor will be allowed to select his own range in the discussion, and may branch off to other subjects if he chooses; but the Editor reserves the right to reject improper communications. All will concede that it is not necessary for scientific writers to call each other knaves and pickpockets, or otherwise impugn the motives of those with whom they do not agree. Let the discussion be full, fair and frank. Conducted in this spirit, the work when completed will be one of great interest and value. The monthly parts will be stitched in handsome paper covers, and the pages of the body of the work will be consecutively numbered, so that they can be conveniently bound for reference and preservation.

Although "THE WHEEL" will be devoted to the solution of the "great question" which heads this article, it will also contain space for the discussion of other scientific questions, the only requisite being that the several writers shall supply the cost of setting their types.

Each contributor will be entitled gratis to one copy of "THE WHEEL" in which his communication appears.

Address all letters to Munn & Co., 37 Park Row.

EDITORS SCIENTIFIC AMERICAN:—Your question of a movable wheel rolling round a fixed wheel *as* you state it and decide it, is not to be disputed; but when we come to consider axles, centers, and revolutions, and connect these terms with forces and motions, we shall surely find questionable points in your solutions, whether with the printing roller, corduroy and wheelbarrow, or rolling a plain wheel round another plain wheel of same diameter. As a plain hand rolling question the movable wheel makes one revolution on its own axis while rolling once round a fixed wheel of the same diameter. The "ones" have it. Admitted. As a purely geometrical question, applied, or unapplied, to geared machinery, the movable wheel will make two revolutions, or break, and I will wager a printing roller and corduroy wheelbarrow on the result. But to the text. Why is it that two wheels of equal diameter, and each revolving on its axis, rolling reciprocally round each other, will each make one revolution on its, or their, axis, or axes, in so doing? Surely, here comes a point in question. It is a question that has much in it—not for controversy, but for mechanical elucidation and learning, and for the investigation and proper conception of astronomical and planetary motions.

In the "*ones*'" view of the case the force is applied to the periphery; in the "*twos*," the force is applied at the axis. That is the difference, and the only difference, existing between the contestants. You said there was really nothing in the question. There is not, really, in the naked way you put it; but as a mechanical contrivance in geared, rotary, and reciprocating machinery, there is much in it, and I doubt whether you have ever before presented a question that has developed more useful thought than this very simple one. We are in the very same fix as regards the motion of the moon on *its* axis. Reasoning from analogy we suppose it to revolve on its axis once in twenty-eight days, and yet all its phenomena as presented to us can occur without such motion.

Lancaster, Pa. JOHN WISE.

Mr. William Hill, of Springfield, Mass., sends an excellent communication explanatory of the question, with diagrams showing some very interesting forms produced by the several motions. We hope he will have them published in the forthcoming "WHEEL." His letter concludes as follows:—"Permit me to commend the study of this problem of the rolling wheel especially to young mechanics, as there is hardly an element of motion in the whole range of mechanical science, which is not involved directly or indirectly in its solution and the issues naturally growing out of it."

Mr. Jno. B. Wilson, of Chicago, Ill., sends an interestsng communication showing that the philosophers are all wrong, that the cat's eyes will not revolve, whether you swing her by the tail or neck, and finally, that the correct answer to the original question is, *None.* The whole letter ought to appear in THE WHEEL.

The following is only an extract from a letter on the question. We hope our correspondent will have the whole published in THE WHEEL, for it is "a stunner:"

"Allow me to express the opinion that you have unfairly dropped the question without any practical or clear theoretical demonstration in defense of your views; while the defense offered by your correspondents has been very lame indeed. I venture the assertion that in one year from now, when your mind is free from the many points suggested by your correspondents, you will agree with me in this last. If you have read all the letters you have received on this subject we cannot wonder that your brains are muddled, and you fear 'diagrams, theorems, postulates and astronomical observations.'

Peekskill, N. Y., April 4, 1868. H. ANDERSON."

MESSRS. EDITORS:—I see that "L. M. complains very earnestly that you did him injustice in publishing his last communication." Being one of L. M.'s supporters so far, I feel a little interested in relation to the above remark. If L. M. really thinks you have not given him justice all through the discussion, I, as an individual, think otherwise; and I say that I do not believe any discussion could be carried on with more justice, patience and gentlemanly courtesy and good humor, than you (as editors) have shown and exercised toward L. M. and his several supporters (I among the rest). L. M.'s diagrams have been in full, fairly represented, and in some cases duplicated, and I do not see wherein he has any just cause for complaint. I know nothing about L. M. personally, or outside the "SCIENTIFIC," but I supported his theory so far as I considered it to be correct; but the moment that L. M. is dissatisfied with the treatment of the editors toward him in the wheel question, I want the editors to know that I am of quite the reverse opinion. Their patience is astonishing!

Gloucester, N. J. JOHN HEPBURN, SEN.

A NEW GRAFTING WAX.—This being the season for grafting, the following highly recommended recipe for preparing the wax is worthy of trial: One pound of resin, five ounces of 95 per cent alcohol, one ounce of beef tallow, one tablespoonful of spirits of turpentine. Melt the resin over a slow fire, add the beef tallow, and stir with a perfectly dry stick or piece of wire. When somewhat cooled, add the turpentine, and last the alcohol in small quantities, stirring the mass constantly. Should the alcohol cause it to lump, warm again until it melts. Keep in a bottle. Lay it on in a very thin coat with a brush. In a room of moderate temperature, the wax should be of the consistence of molasses. Should it prove thicker, thin it down with alcohol. It is always ready for use, is never affected by heat or cold, and heals up wounds hermetically.

A REPLANTED TOOTH.—A dentist of Zanesville, Ohio, reports to the *Dental Register*, that eleven years ago, a lady applied to him for relief from an aching tooth. In extracting the offending member he permitted the patient to place the instrument on what she believed to be the aching molar, but which proved to be a perfectly sound tooth. The lady was so much annoyed at the loss of the perfect tooth, that the operator replaced it, after it had been out of the mouth about ten minutes, when it became firmly fixed in place, and satisfactorily performed its full masticating duties, until a few months ago, when the lady again sought his professional services, and he found the same replanted tooth aching from an exposed nerve.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING APRIL 7, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,294.—STEAM ENGINE VALVE.—Thomas A. Bisbee (assignor to himself and Edwin R. Stillwell), Dayton, Ohio.

I claim, 1st, The arrangement of two balance chambers with packing rings one being combined with each end of the valve, whereby to obviate the tendency to a rocking motion, caused by one large ring or one series of rings.

2d, The described arrangement of the joint plug, I, packing ring, G, and valve, A, for the purposes described.

3d, The combination in a valve box cover, of the steam passages and strengthening ribs, as described.

4th, The combination of the ring, G, joint plug, I, valve box cover, D, and steam passages, E E E E, substantially as described.

76,295.—PISTON PACKING.—Thomas A. Bisbee (assignor to himself and Edwin R. Stillwell), Dayton, Ohio.

I claim, 1st, The cylindrical plug, E, substantially as and for the purposes described.

2d, The combination of the plug, E, and eccentric ring, A, substantially as described.

76,296.—SPRING BED BOTTOM.—Lewis R. Bradbury, Charlestown, Mass.

I claim the combination of the spring, C, made substantially as shown, with the spring, H, placed under it, the two springs operating together for the purposes substantially as set forth.

76,297.—SAFETY POCKET ATTACHMENT.—John Brosius, Rauch's Gap, Pa.

I claim the safety attachment composed of the jaws, A and B, pins, D, springs, E, levers, F and G, and chain, H, for the purpose and substantially as herein specified.

76,298.—BATH TUB.—A. C. Brownell, Brooklyn, N. Y.

I claim as a new article of manufacture the bath tub constructed as described, consisting of the tongued and grooved bottom and end slats, c c', the curved sides, d, outer frame, b, and curved supporting brackets, B B, all arranged as described for the purpose specified.

76,299.—SPINNING MACHINE.—J. E. Burdge, Cincinnati, O.

I claim the combination and arrangement of the fluted roller, P, cylinder B, and carding cylinders, E2 E3 E1, as and for the purpose set forth.

In combination with the above, the spindles, G, as and for the purpose set forth.

76,300.—COMBINATION LOCK FOR DOOR.—Wm. C. Bussey, San Francisco, Cal.

I claim the bars, D D, and the lugs, s s, for retaining the bolt, together with the plate, F, bar, d, and spring, G, in combination with the grooved annular tumblers, the whole constructed and operating substantially as and for the purpose described.

76,301.—MACHINE FOR GRINDING AND CUTTING DOWN AUGERS.—E. O. Carrington and Edward Carrington, West Meriden, Conn.

We claim the arrangement of the swinging bar, E, carrying one mandrel, B, and other mandrel, d, the said mandrel, d, provided with a self adjusting head, f, and combined with the grinding cylinder, C, the whole operating in the manner substantially as set forth.

76,302.—STOVE GRATE.—Gardner Chilson, Boston, Mass.

I claim the furcated arm, D, for supporting the grate, arranged so as to allow both the tilting and lateral vibration thereof, substantially as herein specified.

Also the grate shaft head and handle, made substantially as represented and as hereinbefore described.

76,303.—ENVELOPE.—Richard S. Clark, Great Bend, Pa.

I claim the flap, A, so placed upon the envelope as to fold over on to the face of the envelope, substantially as and for the purpose described.

76,304.—BUTTER WORKER.—J. L. Colburn, West Burke, Vt.

I claim the wheel, C, constructed as described, operated by the crank, D, in combination with the box, B, when the same are constructed as described in the aforesaid combination.

76,305.—CLOTHES DRYER.—Henry P. Crouse, Hartland, Mich.

I claim the combination of the posts, A and B, the pins, C and D, the wedge E, stop, F, the collars, G and K, the arms, H and I, the lines, J, and pin, L, when constructed, arranged, and operating substantially as and for the purposes designed and herein described.

76,306.—SEED SOWER AND CULTIVATOR.—Charles G. Curtis, Plano, Ill.

I claim, 1st, The cylinder, B, arranged with spiral grooves, a, for distributing seed, substantially as and for the purpose set forth.

2d, The tooth, c, having a curved edge, e, convex back, g, and concaved sides, c c, substantially as described.

3d, The combination of the levers, C E, with the two part roller, P, arranged substantially as set forth.

76,307.—HORSE RAKE.—George Deal, Wilmot, Ohio.

I claim the angle irons, G G, and the standards, H H, and bearing arms, I I, to which the bar, S, is hinged, mounted on said angle irons, constructed and arranged and applied to the rake substantially as and for the purposes herein specified.

Also, the combination and arrangement of the hinged bar, S, rake teeth, L L, and roller, D, so that the said roller balances, or nearly balances, the rake teeth, substantially as specified.

76,308.—MEDICINE.—Benj. W. Donaldson, Dixfield, Me.

I claim the above described compound of medicine, prepared substantially in the manner set forth.

76,309.—SPRITSAIL BOOM SLING.—George Dowling, Fair Haven, Conn.

I claim the sling, D, constructed so as to receive the boom, C, and provided with ears, f, and combined with the swivel, d, on the mast's strap, A, and the whole constructed so as to be adjustable and operate substantially in the manner herein set forth.

76,310.—CULINARY VESSEL.—Horace L. Dunklee, Boston, Mass.

I claim in a culinary apparatus made in sections, as described, the combination in each section of the steaming vessel with its surrounding case, under the arrangement specified, so that the said vessel shall be hung suspended within its case by means of flanges or bearings, a b c, formed upon both the vessel and case, in the manner set forth.

76,311.—SELF CANCELING RAILWAY TICKET.—John Dyer, Chicago, Ill.

I claim a self canceling ticket, composed of any number of checks, firmly fastened in a flexible cover, containing a part of the contract, and which checks are graduated in length and consecutively numbered or otherwise designated and arranged, and which when detached from the cover effectually cancel all obligation represented by them when fastened to the cover, for the purpose and substantially as herein set forth.

76,312.—NECKTIE SUPPORTER.—George R. Eager, East Boston, Mass. Antedated March 21, 1868.

I claim, 1st, The necktie supporter, consisting of the parts, b c, d b', c' d', to engage with, and the saddle or bend, a a', to rest upon the button, and the attaching part, y, all formed and operating as herein described and represented, for the purposes set forth.

2d, The combination, with the above, of the elastic band, G, applied in the manner and for the purposes set forth.

76,313.—WASHING MACHINE.—Nathaniel T. Edson, New Orleans, La. Antedated March 28, 1868.

I claim, 1st, The combination of the apron, fig. 4, with the elastic straps, c the clamp, e, and screw, d, as specified.

2d, The lock, g, in combination with the apron, as specified.

3d, The combination of the rubber or basket with the double crank, z a and collar, h, as and for the purpose specified.

76,314.—BROILING APPARATUS.—Mary E. A. W. Evard, Leesburg, Va.

I claim the combination of the pivoted frame, G G1 G2, hinged and notched plate, M, for supporting the revolving broiler or spit at any desired distance from the fire, substantially as described.

2d, The combined arrangement, in connection with the foregoing, of the oven, B, of the flap, C, and doors, D D' and E, substantially as and for the purposes set forth.

76,315.—COOKING STOVE.—Mary E. A. W. Evard, Leesburg, Va.

I claim, 1st, The plate, A1, employed in conjunction with the grate bars, a, to form the bottom of the fire box, substantially as and for the purpose set forth.

2d, The movable shelf, O', adapted to be supported upon the front doors, O, substantially as and for the purpose set forth.

3d, The removable supplemental heater, P, provided with a damper, P2, and employed in the manner and for the purpose set forth.

4th, The foraminated air distributers, N, when provided with registers, n n', and constructed and arranged substantially as and for the purpose described.

5th, The grooved ridges, c and f, cast on the top and bottom plates of the oven, serving to impart strength and rigidity to said plates, without obstructing the flues, and also to guide and support removable partitions, F F1, for dividing the oven into a plurality of compartments, substantially as described, in combination with the opening, L, in the rear of the oven.

76,316.—TOASTER.—Mary E. A. W. Evard, Leesburg, Pa.

I claim, 1st, The rack, C, adapted to be turned upon the standard, B, substantially as and for the purpose described.

2d, The nut, D, formed with threaded perforations, d d', at right angles, to adapt the rack to be supported either vertically or horizontally, substantially as set forth.

76,317.—SUSPENSION SPRING FOR LAMPS.—John A. Evarts (assignor to Bradley and Hubbard), West Meriden, Conn.

I claim, 1st, The combination of the coil spring, F, with the band, G, and lower friction roll, D, substantially as specified.

2d, The combination of the coil spring, F, with the band, G, and ratchet, whether the ratchet be applied directly to the cylinder, A, or to the friction roll, substantially as described.

3d, The combination of the coil spring, F, the band, G, and the upper lower friction rolls, H and D, substantially as described.

4th, The combination of the coil spring, F, the band, G, the two rolls, H and D, with the ratchet and pawl, constructed and arranged substantially as set forth.

76,318.—PUMP.—Alford Fisher, Nashua, N. H.

I claim the described arrangement and combination of the rod, A, independent ball, B, the flange cap, O, fastening rods, M M', and neck piece, D.

76,319.—LAMP EXTINGUISHER.—Joseph W. Fowle, Boston, Mass., assignor to Wm. Carlton, Rufus S. Merrill and Chas. E. Abbott.

I claim a lamp extinguisher consisting of inclined slides, which, when brought into contact form a close chamber over the mouth of the wick tube, substantially in the manner described.

76,320.—FRUIT GATHERER.—C. W. Gage, Homer, N. Y.

I claim the polygonal hoop, B, when constructed in such manner as to fold separately from the cloth table, F, and center pieces, C, as shown in fig. 3, as and for the purpose set forth.

76,321.—GAS COOKING APPARATUS.—Michael Germann, Cincinnati, Ohio.

I claim as an article of manufacture the gas cooking apparatus as described, consisting of an iron bracket, pot stand and gas burner combined, substantially as and for the purposes set forth.

76,322.—STEAM ENGINE GOVERNOR.—Joseph W. Gray, Clermont County, Ohio, assignor to Saladee, Fee & Co.

I claim the combination of a steam gage and governor, so constructed and arranged that the pressure of the steam in the boiler shall govern the engine, substantially as shown and described.

76,323.—SEWING MACHINE FOR WORKING BUTTON HOLES.—M. C. Gritzner, Bruchsal, Grand Duchy of Baden.

I claim, 1st, The combination with the needle of a sewing machine, or ordinary or suitable construction, of a laterally reciprocating tongue plate, substantially as specified, and mechanism for imparting said movement to the tongue under the arrangement described, so that the said tongue will be placed close to and alternately to the right and left of the needle, during each two successive stitches the needle makes, and so impart a zigzag motion to the cloth to be sewed, substantially as shown and specified.

2d, The laterally reciprocating plate having two slots, one on each side of the tongue, through which the needle alternately stitches, the metal around said slots serving as firm support to the cloth, and preventing the latter from being dragged down when penetrated by the needle.

3d, The mechanism herein described for moving the material for button hole sewing, etc., combined with gearing and a cam, or its equivalent, substantially as specified, applied to a sewing machine in such manner that the said mechanism, when engaged with said gearing and cam, will move laterally in one direction with the needle, makes one stitch, and in the opposite direction during the next succeeding stitch, as shown and set forth.

4th, The combination of the laterally reciprocating tongue or plate with a feed piece adapted to engage with the ordinary feed dog of a sewing machine, and so arranged that the said feed piece, while moving laterally with the reciprocating tongue, shall have an independent forward and backward and up and down movement, for the purpose of effecting the feed of the cloth, as set forth.

5th, The combination and arrangement of the plates, a b, and the plate, c, and its appurtenances, the whole constituting a device or mechanism for button hole sewing, etc., capable of being applied either temporarily or permanently to any suitable sewing machine, in the manner herein shown and described.

76,324.—SKATE.—M. C. Haight, Geneva, N. Y.

I claim combining the foot and heel-plates, B C, directly with the runner, A by means of the solid screws, a a', forming a part of the runner itself, and making the screws, b b, that attach the straps to the footplate sharp pointed, to serve as the brads for holding the foot, the whole arranged as described, and operating in the manner and for the purpose specified.

76,325.—CAR SEAT.—Stephen B. Holden (assignor to himself and Wm. A. Newton), Sedalia, Mo.

I claim, 1st, The combination of the rubber or equivalent springs, F, with the seat frame, D, and with the longitudinal bar, b2, of the stand, B, substantially as herein shown and described, and for the purpose set forth.

2d, The rubber block springs, H, in combination with the longitudinal bar, b2, of the stand, B, substantially as herein shown and described and for the purpose set forth.

76,326.—BASE BURNING STOVE.—Robert Holmes, Detroit, Mich.

I claim the combination and arrangement of the dampers, E I, and flues, D, O, L and P, to produce a downward or a direct draft, substantially as described.

76,327.—SIFTER.—S. S. Hughson, Newark, N. J.

I claim the construction of the cylindrical sifter with the sieve, C, in the center, the sliding lid, G, and handles, I K, on the top of the sifter, door, M, at the side, substantially as and for the purpose specified.

76,328.—FRICTION CLUTCH.—James B. Johnson and Wm. H. Birch, San Francisco, Cal.

We claim, 1st, The axle, A, with its fast pulley, B, and enclosing case, C, with its inclined planes, c' c', together with the rollers, a a a, the whole constructed and operating substantially as and for the purpose described.

2d, We claim the spring, d, attached to the projection, b, or its equivalent, when used in the clutch for insuring a prompt action of the rollers, a a, substantially as described.

76,329.—HEATING APPARATUS.—John Johnson, Saco, Me.

I claim the method of obtaining and transmitting heat by the use of a small and definite quantity of water or other liquid contained in an air-tight vessel, substantially as herein described.

76,330.—DEVICE FOR HOLDING CANS WHILE BEING SOLDERED.—Thomas Kerr and John C. Kelley, Edinburg, Ind.

We claim the sleeve, E, screw shaft, D, springs, I I, nuts, F H, staves, K, arm, M, plate, N, and lever, L, all constructed and arranged substantially as and for the purposes herein set forth.

76,331.—APPARATUS FOR SEPARATING ORES AND MINERALS.—Stephen R. Krom, New York city.

I claim, 1st, In machines for separating granular materials of different densities by the aid of intermittent jets of air or other fluid, the passage, F, to discharge the lower stratum, either from an inclined or level bed of a double or single machine, as herein described.

2d, In such machine, the small apron, G, at the lower discharge, as described.

3d, In such machine, the shoe, F', at the lower end of the lower discharge as described.

4th, In such machine, the escape valves, c c, for the purpose described.

5th, In such machine, the blowing means, or its equivalents, situated close to the material, in combination with the within-described manner of maintaining its proximity under various changes of stroke, for the purpose described.

6th, The bellows, C, having a series of flaps, C2, covering nearly the whole open-work or perforated surface, as shown in Figs. 1, 5 and 7.

7th, In such machine, the cam wheel, D, constructed and arranged relatively to the lever, D, and its connections, as and for the purpose described.

8th, In such machine, the closed box, H, constructed and arranged relatively to the inclosed and connected parts, substantially as and for the purpose herein described.

76,332.—OX YOKE.—Isaac W. Little, Newbury, Mass.

I claim the arrangement and combination of the sliders, b, and their clamping screws or devices, with each of the bows, B B, and with slots, a a, formed in the yoke, as set forth.

76,333.—GAS BURNER.—Richard B. Locke (assignor to the Self-Lighting Gas Burner Company), New York city.

I claim the screw, I, in combination with a supplementary burner, when the same is constructed and arranged substantially as described.

76,334.—NAME PLATE FOR STREET LAMP.—Thomas T. Markland, Jr., Philadelphia, Pa.

I claim the name plates, B, in combination with street lamps, constructed and arranged substantially as described.

76,335.—STREET LAMP.—T. T. Markland, Jr., Philadelphia, Pa.

I claim, 1st, The combination of name plates, C, with the frame of the lamp, separate from the main panes of glass or the body of the lamp, whether of square or other form, substantially in the manner above described and for the purpose set forth.

2d, The combination of the name plates, G, with the neck, F, of the lamp, substantially as described and for the purpose specified.

3d, The combination of a glass neck with a street lamp, the said neck being constructed either with or without name plates, substantially as and for the purposes above described.

4th, The combination of the slot, l, of the tube, N, on the bottom plate, E, with a corresponding lug on the lamp post, substantially as described and for the purpose set forth.

5th, A sectional lamp, constructed substantially as described and for the purposes specified.

76,336.—CHILD'S BED.—Mary E. J. Marr, Jefferson, La.

I claim the bedstead proper, herein described, consisting of the horizontal pieces, A A' A'' A,''' posts, B, and arched frame, C C' D, in combination with the frame, E, when the latter is constructed as herein described, and provided with a cloth bottom, G, and cloth sides and ends, F, and transverse cross band, H, and is hinged to the beostead proper, substantially as and for the purpose set forth.

76,337.—BRICK MACHINE.—Ignace Martin, Newark, N. J.

I claim, 1st, The board or plate, G, in combination with the eccentric shafts, H H, hooks, m, and pins, n, all made and operating substantially as herein shown and described.

2d, The mold wheel, A, when provided with notches, s s, in combiantion with the spring catch, r, and cam, t, all made and operating substantially as and for the purpose herein shown and described.

3d, The trough, N, as a receptacle for oil, and a brush, M, arranged to revolve therein, and contiguous with the plungers, to lubricate them, as specified, when arranged beneath and operating in combination with the revolving mold wheel, A, and secured to the base plate, C, substantially as described and shown.

4th, The combination, with the wheel, A, of the plate, G, and eccentrics, H, of the plungers, J, stems, k, and cam, p, all made and operating as set forth.

76,338.—PROCESS FOR MAKING GAS.—James McGeary, Salem, Mass.

I claim, 1st, The use of partially-spent coal, in one retort, to quicken and intensify the heat in another retort or chamber, alternately, as set forth.

2d, The use of partially-spent coal for decomposing superheated steam, substantially as set forth.

3d, The use of superheated steam, produced as described, as and for the purpose set forth.

76,339.—HARVESTER RAKE.—D. Mendenhall, Fairfield, Iowa.

I claim, 1st, A reciprocating rake, and a hinged platform section, combined in such manner that after the rake moves across said platform and delivers a gavel from the inner side thereof, it shall then return beneath said section to the outer end of the platform, substantially as described.

2d, A platform, having a location behind the cutting apparatus during the receiving and delivery operation, and a fender or guard, J, between the cutting apparatus and the rear of the platform, in combination with a reciprocating rake, which takes the grain which has been cut from the platform, and delivers it at one side of the platform out of the path of the team, such rake being guided by machinery, the whole substantially as herein set forth.

3d, A rake or clearer, which is controlled in its movements by extension joints, L, and a pitman rod, N, and which is pivoted on top of the platform, in combination with a hinged grain guard, J, which will protect the clearer from falling grain during its return stroke, substantially as described.

4th, The combination of a reciprocating rake, a side-delivery platform, a hinged guard, J, and an outer guard, b, substantially as described.

76,340.—FEEDING MECHANISM FOR SEWING MACHINES.—John A. Minor, Middletown, Conn.

I claim the arrangement, on the independent adjustable plate, K, of the lever, S, and the feed dog, L, substantially as described and for the purpose specified.

76,341.—BRICK MACHINE.—James W. Osgood (assignor to himself and S. V. R. Carpenter), Columbus, Ohio.

I claim, 1st, A revolving feeding cam, B1, applied within a filling box, B, and interposed between a pug mill and a rotary mold drum, substantially as and for the purpose described.

2d, A reciprocating knife, C, arranged in combination with the filler, B1, and the movable mold wheel, substantially as and for the purpose described.

3d, A wiper or scraper, B2, in combination with a filler, B1, operating substantially as described.

4th, The guard or division plate, a1, in combination with a horizontal cylindric peg follower and filling box, arranged substantially in the manner and for the purpose described.

5th, Securing the central follower, D1, of each gang or series of mold cells B, rigidly to bar, D2, and having the other followers of the same gang attached loosely to said bar, for the purpose of preventing the followers from working hard or binding in their mold cells, substantially as described.

6th, B platen, F, hung by means of arms, F2, which are pivoted to the frame, A, and jointed, as at f8, to arms, F1, of the platen, so that the face of this platen shall fit squarely against the mold drum, D, notwithstanding that the platen swings on a pivot or pivots, substantially as described.

7th, Providing the platen, F, with cloth rollers, H, ratchet wheels, f2, and pawls, f3, substantially as described.

8th, Effecting the compression and condensation of the clay in the mold cells, by means of reciprocating hooked press rods, H, acting upon the exterior ends of the follower bars, D2, in combination with a platen, F, said bars, H, and platen, F, being operated by means of cams upon a crank shaft, G, substantially as described.

9th, The arrangement of the expelling hooks, I, and the specified mechanism for operating these hooks, to wit, the cam, k, yoke, K, and bell crank, I1 I2, substantially as described.

10th, The combination and arrangement of devices specified, whereby the mold drum, D, the platen, F, the press bars, H, and the expelling hooks are operated from a single shaft, G, substantially as described.

11th, The combination and arrangement of the cam, H x and f5, the crank shaft, G, lever, G3, press rods, H, mold drum, D, and platen, F, substantially as and for the purpose described.

12th, The adjustable cross head, g1, and adjusting pin, j, applied to the yoke of each one of the pressing rods, H, substantially as described.

13th, A yielding receiving platform, E, constructed and arranged beneath the mold drum, D, and supported in such a manner as to receive the bricks as they are expelled from said drum, and descend and yield under the weight of the bricks, substantially as described.

76,342.—AROMATIC LINING FOR CARPETS, CHESTS, DRAWERS, WARDROBES, ETC.—John M. Perkins, Plainfield, N. J.

I claim as aromatic lining, when constructed substantially as described, for carpets, wardrobes, chests, and the like, for the purpose of protecting said carpets, and the contents of said wardrobes, chests, and the like, from the ravages of moths and other destructive insects.

76,343.—ROTARY CUTTER FOR PLOWS.—John C. Pfeil, Argenzville, Ill.

I claim, 1st, The peculiar arrangement and combination of the spindle, B, on cutter arm, A, and collar, M, with hole, B, therein, for the purpose of forming a caster joint for cutter, E, substantially in the manner and for the purpose herein specified.

2d, The slots, L L, in the cutter arm, A, whether said arm be for a rotary or any other kind of cutter, where said slots are used to allow of vertical adjustments of said cutter, substantially in the manner and for the purpose herein specified.

3d, The pin, C, when said pin serves both to secure the collar, M, on the spindle, A, and to limit the rotary or caster motion of the cutter, E, in the manner and for the purpose herein specified.

76,344.—COFFIN.—Collins Potter, Pawlet, Vt., and Eleazer Jones, Middle Granville, N. Y.

We claim, as a new and improved article of manufacture, a coffin, constructed substantially as herein described.

76,345.—CHEESE HOOP.—Stephen Purdy (assignor to himself and Ellis Ellis), Whitestown, N. Y.

I claim, 1st, Constructing cheese hoops with a side opening, or openings with a flange on each side, and a clamp or clamps to hold them together, in the manner substantially as described and for the uses and purposes mentioned.

2d, The said hoop with openings, flanges, and clamps, in combination with the plate, A', constructed and operating as described and for the uses and purposes mentioned.

3d, The said hoop with the openings, flanges, and clamps, in combination with the spring or catch, D, and the cross openings, B4 and B5, constructed and operating substantially as described and for the uses and purposes mentioned.

76,346.—CHRONOMETER ESCAPEMENT.—George P. Read, Boston, Mass.

I claim the mode, substantially as herein shown and described, of applying the feather or the hair spring of a chronometer or watch escapement, that is, by means of the saw kerf, e, and screw, f, substantially in manner and for the purpose as before explained.

76,347.—BUTTONHOLE FOR PAPER ARTICLES OF WEARING APPAREL.—William C. Reeves, Boston, and Louis L. Solomon, Charlestown, Mass.

We claim the buttonhole, as composed of a close straight slit, a a, and a hole, B, arranged together, substantially as represented in fig. 1 of the above-mentioned drawings.

76,348.—RAILWAY.—Elisha Robbins, Worcester, Mass.

I claim, in combination with an iron rail, a metallic chair or supporter, C, to receive it, and extend longitudinally and continuously under such rail, and from end to end of it, and upon a series of ties, or their equivalent, and lap on either or both flanges of the base of the rail, as specified.

Also, such a chair, as made or divided lengthwise in two parts, with a lip or flange to each, to grasp and extend over the base of a rail, as specified.

Also, in combination with two parallel rails, A A, of a railway, the cross or duplex chair, D, made with lips to grasp the bases of the opposite rails, or two longitudinal chairs or supporters, C C, applied thereto in manner as specified.

Also, the combination of the metallic brace E, with the parallel rails, A A, and the transverse or duplex chair, D, applied to such rails, or to their longitudinal metallic supports or chairs, C C, as explained.

76,349.—SCROLL SAW MILL.—Elisha Robbins, Worcester, Mass.

I claim the combination of the sliding counterbalance weight, its connecting rod and operative crank, with a saw and frame, and the connecting rod and crank thereof, the whole being constructed and arranged to operate substantially as specified.

76,350.—CHURN.—Timothy Rose, Cortlandville, N. Y.

I claim, 1st, The solid divider, when of less hight than the depth of the cream chamber, in combination with a rocking churn, for the purpose herein described.

2d, The double wedge-shaped divider, G, having an automatic rising and falling motion, deprived from the combined action of the churn and cream, for the purpose of opening a passage beneath it from end to end of the chamber, as herein described.

3d, The fixed beaters, made concave on their under sides, forming a series of air chambers, as herein described.

4th, The rockers, having their front ends made of curves, whose radii are less than the curves of their rear ends, and providing the latter with springs, for the purpose herein described.

5th, The arrangement of the seat, D, platform, E, and vertical hand lever, F, in combination with a rocking churn, as herein described.

6th, The air tube, J, having a hood, K, at its outer end, and a valve, l, within its inner end, when applied to a rocking churn, as herein described.

76,351.—SCREW CUTTING MACHINE.—Edward Royon, Piqua, Ohio.

I claim, 1st, As herein arranged and for the purpose explained, the hollow die chuck, E, having the permanent head, F, clip, G, with opposite eccentric arcs, g g', sliding jaws, H, notched revolving ring, I, eccentric, f' f'', and plate, J.

2d, The combination of the hollow shaft, B, die chuck, E, jaws, H, adjustable dies, K, and bolts, L.

3d, The notched and adjustable plate, M, and tightening screw, N, in combination with the tumbler, P, ring, I, and spring, Q.

4th, In combination with the screw-threading machine herein described, the right and left screw, t t', jaws, t'' t''', socket, W, and nut, X, all arranged as set forth.

76,352.—HORSE HAY FORK.—Peter Schwitzer, Robeson Township, Pa.

I claim the arrangement of the slotted frame, D, double-jointed levers, E E, and connecting rod, F, as herein described and for the purposes set forth

76,353.—ANKLE BRACE.—Samuel B. Shearer, Aurora, Ill.

I claim the supporter, A, in combination with the straps, B and D, and lacing, C, or their equivalent, for the purpose and substantially as herein specified.

76,354.—CHILDREN'S CORSETS.—Martha B. Solomon, Charlestown, assignor to Louis L. Solomon, Charlestown, and William C. Reeves, Boston, Mass.

I claim, as a new article of manufacture, a child's corset and underclothes supporter, with two series of bone and wicking receptacles or pockets, combined with the body, as set forth, such body being provided, as described, with rows of buttons for supporting skirts and drawers, arranged and operating in the manner as shown and described.

76,355.—CARPET STRETCHER.—Levi B. Southworth, Deep River, Conn.

I claim the joint, B one or more points, C, and brace, E, in combination with the head, D, as and for the purpose specified.

75,356.—HAME LOCK.—Joseph A. Stansbury, Marion, Iowa.

I claim, 1st, The slotted lever, C, when used as and for the purpose specified and set forth.

2d, In combination with the manner of binding the lever, C, in its proper position by the tendency of the two curved plates, A and E, to straighten when under lengthwise strain, as within substantially described.

76,357.—MODE OF ATTACHING SHAFTS TO VEHICLES.—Smith Thompson, Montgomery county, Md., assignor to S. S. Fahnestock, Washington, D. C.

I claim the jointed bar, C, constructed and operated in the manner substantially as shown and described and for the purpose set forth.

76,358.—ELECTRIC TELEGRAPH.—Cromwell Fleetwood Varley, New York city.

I claim, 1st, Making insulators for telegraph wires of two or more insulating caps, exclusive of the cement which unites them, each cap being a complete insulator in itself, so that if one of the caps be defective, the other or others shall arrest the electric current, as set forth.

2d, The use of a non-conducting pin inside an insulating cap, such pin being constructed of iron or steel covered with hard rubber, or being formed of stoneware or porcelain, substantially as described.

3d, Glazing the lower part of porcelain or stoneware or earthenware caps, and leaving the upper part unglazed, substantially as and for the purposes set forth.

4th, Making the lower edge of the insulator cap externally sharp, but internally rounded, so that drops of rain, when blown outward, shall fall off, and when blown inward shall not break off, but run, by capillary attraction, up the rounded surface out of the wind, substantially as set forth.

5th, Making porcelain or stoneware or earthenware caps with two or more projecting ears, in combination with and arranged above and below the groove for the wire, so that when the insulator is inclined to the wire, the latter can be inserted, but when at right angles to it, the latter cannot be gotten out, as set forth.

76,359.—DITCHING MACHINE.—John Vaughn, Miami county, and Eli Chamnes, Grant county, Ind.

We claim the combination and arrangement of the wheel, B, jack or clamper, C, framing, A, dashboard, g, feet, d, and handles, c, substantially in the manner and for the purposes as herein set forth.

76,360.—DROP LIGHT FOR CHANDELIERS.—Wm. C. Vosburgh, Brooklyn, N. Y.

I claim, 1st, The case, B, having the longitudinal slot and notches, I I, to catch and retain the pin, N, so that the drop light may be retained at any desired hight.

2d, The case, B, made as described, in combination with the flexible tube, C, pulley, P, and weighted disk, D, substantially as and for the purposes herein set forth and described.

76,361.—APPARATUS FOR TAKING SOUNDINGS.—Thomas Walker and Thomas F. Walker, Birmingham, England. Patented in England Dec. 30, 1866.

We claim, 1st, The combination and arrangement of the disk plate, e, provided with numbers to correspond with the movements of one of the indicating wheels, and connected by spring pressure, so as to move with such wheel, when geared to give motion to another indicating wheel, so that any movement given to said plate may simultaneously effect the corresponding movement of such other indicating wheel, substantially as set forth.

2d, The application of the spring check, l and stop, k, to the disk plate, e, to indicate the point of starting, substantially as shown and described.

3d, The application of the notches, j j, or equivalent, in combination with the stop, k, to the disk plate, e, in order that the distance of its partial rotation may be ascertained by feeling the same after use, substantially as set forth.

4th, The application of a rope, s, or equivalent connection, between the sounding machine and the weight used to aid the descent of such machine, for preventing the action of the indicating devices from being impeded by the "wake" of such weight, as set forth.

76,362.—CORN POPPER AND COFFEE ROASTER.—L. A. Warner, Freeport, Ill.

I claim, 1st, The outer movable cylinder or jacket, constructed so as to be removed at pleasure, when used to inclose a wire cloth cylinder, with a space between, in the manner substantially as described and for the purposes set forth.

2d, The cylinders, A and X, combined so as to be convertible into an open popper or a tight roaster, in the manner described, and combined with the holes, d and l, and plate, g, the holes, e, cams, f, axle, B, and handle, C, in the manner substantially as described and for the purposes set forth.

76,363.—WOOD TURNING LATHE.—Wm. J. Watson, Benton Center, N. Y.

I claim a tail block having a pair of movable center holding jaws, e, when the securing devices for the tail block and the operating devices for the said jams act in conjunction, substantially as and for the purpose set forth.

76,364.—FURNACE FOR SMELTING LEAD ORE.—David P. Webster, New York city.

I claim, 1st, The method herein described of forming the interior or lining of furnaces, that is to say, by building the bed, walls, and arch of the plastic material herein described, or the substantial equivalent thereof, in the manner shown and specified, and subjecting the same, when formed into shape to heat, as herein set forth.

2d, The use and employment of the ingredients herein described, for repairing cracks or other injuries, or parts worn by the action of fluxes, substantially as herein set forth.

3d, The combination with the furnace of an iron casing or pan under the arrangement herein shown and described, so as to support the plastic structure of the furnace, and also to allow free passage of air under and around the same, as and for the purposes set forth.

76,365.—RAILWAY FROG.—George Westinghouse, Jr., Schenectady, N. Y.

I claim the arrangement of a chair, c, under one or both ends of the frog A, substantially as and for the purpose described.

76,366.—LANTERN.—Wm. Westlake, Brooklyn, N. Y.

I claim, 1st, Constructing the base or support of a lantern entirely of wire, or, open, so as not to materially obstruct the passage of the light downward, substantially as specified.

2d, Connecting the open or wire base, F L, and the guard to the band, C substantially as specified.

3d, The ledge H H', bead or wire, G, in combination with the band, C, and lamp, I, substantially as and for the purposes specified.

4th, The eyes or loops, J, for securing the guard and base to the band, C, substantially as specified.

5th, Making the vertical guard wires, E, and the base wires, F, of the same piece of wire, substantially as specified.

76,367.—MANUFACTURE OF SPOUTS FOR TEAPOTS.—William Westlake, Brooklyn, N. Y.

I claim the method herein described of forming curved or bent spouts of a single piece of sheet metal, substantially as specified.

76,368.—CAR COUPLING.—Edwin R. Whitney (assignor to himself and Joseph Frazer), Plattsburg, N. Y.

I claim, 1st, The construction of the revolving four-armed cross, C, pivoted dog, D, bent spring, E, lever, F, and bar, b, all arranged and operating as described, for the purpose specified.

2d, The above in combination with the pawl, c, fitting into a recess in a lug, d, projecting from the lever, F, as set forth.

76,369.—HARNESS.—Wm. S. Wood, Hatborough, Pa.

I claim a harness composed of open collar, with permanent hames, H H', rope or strap, a b, spring hook, k, all combined and constructed and operating in the manner and for the purposes above set forth and described.

76,370.—CLOCK.—Robert Woolworth, New Haven, Conn.

I claim, 1st, The count wheel, D, divided substantially in the manner described, so that in the revolution of the said wheel, the count hook will fall into the proper slot to arrest the movement of the wheel at the proper time, and so that the given number of revolutions more than one of the said wheel will complete the strokes required for each twelve hours, the said wheel at the completion of such number of revolutions arriving at the point of starting, as herein set forth.

2d, The combination of the count wheel, D, and pinion, I, each bearing to the other the relative proportion,, and so as to operate substantially as specified.

3d, The arrangement of the strike wheel, F, with the count hook, and combined with the count wheel, D, so as to operate substantially as set forth.

76,371.—POTATO DIGGER.—B. P. Wright, San Francisco, Cal.

I claim a potato digger having the spade, D E, the inclined carrying or elevating belt, G, and the belts, J J, together with the cleaning sieve, K, the whole constructed and operating substantially as and for the purposes herein described.

76,372.—EXPANDING MANDREL.—David L. Allen, Williamsport, Pa.

I claim the combination and arrangement of the chuck, annual plates, C set screws and springs, D, connecting screw, E, with the arbors, A and B, and cones, A A and B E, substantially in the manner and for the purposes as herein set forth.

76,373.—PAPER CUTTING MACHINE.—J. Lathrop Allen (assignor to himself and Marshall Lefferts), New York city.

I claim providing the reciprocating shear, having fixed inclines for closing the shear, with adjustable links and cranks for reciprocating said shear, substantially as set forth.

76,374.—BREECH-LOADING FIRE-ARM.—Chas. H. Alsop, Middletown, Conn., assignor to Joseph W. Alsop, New York city.

I claim, 1st, The spiral spring, c, in combination with the groove, a, in the plate, B, the rib, b, upon the under side of the barrels, the perforated lip, D and the vertical pin, E, having a beveled end, all arranged as described whereby as the pin, E, is raised by the spring lever, F, the spring, c, throws the barrels forward, for the insertion of the cartridge, as herein shown and described.

2d, The catch or fastening composed of the vertical pin or bolt, E, fitted in the breech, and pivoted to the spring lever, F, in combination with the perforated lip, D at the under side of the rear of the barrel or barrels, and the recess, e, in the breech, to receive the lip, all arranged substantially as and for the purpose specified.

76,375.—ROOF.—Edward Atkinson, Wrightstown, Pa.

I claim a roof consisting of slats covered with layers of cement, between which is interposed a sheet of felt, substantially as described.

76,376.—COFFIN.—Samuel Avery and Lewis Delill, Phœnix, N. Y.

We claim as a new article of manufacture, a wooden coffin having its parallel sides formed without bending the timber, substantially as and for the purpose set forth.

76,377.—WHIFFLETREE HOOK.—Chas. B. Babcock, Frankfort, N. Y., assignor to himself and D. M. Golden, Frankfort, and B. G Eaton, Mexico, N. Y.

I claim, 1st, The cylinder A, provided with projections, a and b, and groove or slot, c, substantially as and for the purpose set forth.

2d, In combination with the above the hook, B, substantially as and for the purpose specified.

76,378.—CONSTRUCTION OF ICE PITCHERS.—Jacob B. Bailey (assignor to the Bailey Manufacturing Company), New York city.

I claim, 1st, The foot or socket, e, of the inner bottom plate, c, extending downward into the projection, g, of the bottom, d, substantially as set forth.

2d, The protecting plate, f, in combination with the double bottom of the ice pitcher or water cooler, said protecting plate being introduced within the pitcher, and secured substantially as set forth.

76,379.—MUCILAGE BOTTLE.—H. O. Baker, New York city

I claim the wire, or its equivalent, in combination with the groove at the base or in the neck of the bottle, substantially as and for the purposes as herein set forth.

76,380.—NUT FOR JOINT BOLTS.—James Baldwin, Manchester, N. H.

I claim a joint bolt nut having a concave face, essentially in manner and for the purpose as herein shown and described.

76,381.—STEAM GENERATOR.—William Ball, Chicopee, Mass.

I claim, 1st, In a stationary horizontal flue boiler, a fire box made open from bottom to top, and without a crown sheet.

2d, The water tubes, c c, extending across the upper part of the fire box, and entering the water spaces at the sides or ends of the fire box, as described, in combination with a covering of fire brick, or other like material, the whole arranged and operating substantially as described, and constituting a substitute for the crown sheet used over the fire box of stationary steam boilers.

76,382.—APPARATUS FOR TREATING FRACTURES AND DISLOCATIONS.—Elizur H. Barnes, Marathon, N. Y.

I claim, 1st, The curved forms or rests, K and C, when used respectively upon the leg or arm, in combination with the parts, I F and G.

2d, The rod, D, when bent as represented at its upper end, in combination with the said parts, I F and G, for the purposes set forth.

3d, The rod, B, and rest, A, in combination with the parts, D I F and L, for the uses and purposes set forth.

76,383.—SKATE.—E. H. Barney, Springfield, Mass.

I claim a skate fastening having the sharp or safety edge, d, formed upon the outer and lower portion of the clamp, when constructed and operating substantially as herein described and for the purposes specified.

76,384.—SAWMILL.—David B. Bartholomew, Lancaster, Pa.

I claim, 1st, The combination of the movable frame, I' H', carrying the feed rollers, I I and H H, with the slotted post, h h, rack, V, plates, W, weighted pulley, Q, hand screw, U, and latch, x x, when constructed, arranged, and operated in the manner and for the purposes described.

2d, The hinged slotted bar, E, upon which are saw guard, D, pins, p p, and wedge roller, P, all constructed and operating substantially as described.

3d, The deflecting device, when constructed with the rollers, n n and o and operating substantially as set forth.

76,385.—SEWING MACHINE.—J. W. Bartlett, New York city

I claim, 1st, In combination with the rods, C and F, the internally toothed gear wheel, B, pinion, R, eccentric, D, rod, E, and hook, G, constructed, arranged, and operating substantially as and for the purpose set forth.

2d, In combination with the rods, C and F, the eccentric, D, rod, E, cam, H, hook, G, spring, L, feed dog, J, and screw, K, constructed and operating substantially as and for the purposes set forth.

76,386.—PAINT MILL.—Charles Belcher, Newark, N. J.

I claim the two revolving grinders, A and B, the upper one about half the size of the other, when combined with the scraper, C, arranged and operated relatively to each other as above described, and for the purpose set forth.

76,387.—FISHING ATTACHMENT FOR VESSELS.—Thomas Bell, Bellport, N. Y.

I claim a device for catching fish constructed and applied to a vessel substantially in the manner as herein set forth.

76,388.—THERMOSTATS.—Karl Bender and Chas. F. Teller, Bankhofe Offenbach, A. M., Grand Duchy of Hesse, assignor to Martin Loebner, Newark, N. J.

We claim, 1st, The coiled plate, F, in combination with a register, B, and the arm or lever, D, or its equivalent, all arranged substantially in the manner as and for the purpose set forth.

2d, The screw rod, I, and bent arm, L, for adjusting the arm or lever, D, to regulate the temperature of the room, substantially as shown and described.

3d, The index crank, J, on screw rod, I in connection with the graduating

dial plate, K, bent arm, L, and the arm or lever, D, all arranged substantially as and for the purpose set forth.

76,389.—FLUTE.—Theodore Berteling, New York city.

I claim the adjustable set screws, C, in connection with the keys, B, of a flute, operating in the manner and for the purpose substantially as described.

76,390.—DEVICE FOR KEEPING FOOD WARM.—Edward Bevan, Birkenhead, for himself and Margaret Fleming, Shipston-on-Stour, England, administratrix of the estate of Abel Fleming, deceased, assignors to Edward Bevan.

We claim the within described means or apparatus for warming and keeping warm, articles of food, consisting substantially of the removable vessel b, heating agent, space, and a vessel, a d c, air space and vessel, i g, or its equivalent, and a non-conducting cover, combined in the manner set forth.

76,391.—EDGE FINISHING TOOL.—John B. Blanchard, Marlboro, Mass.

I claim combining with the flanged body of an edge finishing tool, a spring worked gage, substantially as and for the purpose described.

76,392.—APPARATUS FOR EVAPORATING CANE JUICE.—Thérence Boutté, New Iberia, La.

I claim the furnace, A, and flue, E, when these parts are severally constructed, united, and operate as herein described, in combination with the kettles, D, when the whole constitutes a portable cane juice evaporating apparatus, as and for the purpose set forth.

76,393.—WASHING MACHINE.—Elijah Y. Boyce, Middlebury, Vt.

I claim an improved washing machine consisting of the frame, B, stationary dasher, C D, box, A, bar, a, rod, b, eye, E, and lever or rod, G, all constructed, arranged, and operating as described and specified.

76,394.—DUMMY FOR DISPLAYING CLOTH.—W. E. Brock, New York city.

I claim the dummy composed of the paper or papier mache shell, A, head piece, a, supporting shaft, B, base, C, and braces, b, the whole arranged substantially as and for the purpose specified, as a new article of manufacture.

76,395.—SAW.—Ira S. Brown and Chas. N. Brown (assignor to themselves and J. Mason Gross), Providence, R. I. Antedated Jan. 3, 1868.

We claim the combination of a cutting and planing tooth in one and the same piece of metal, constructed and operating substantially as above specified.

76,396.—MUSICAL RETURN BALL.—John Burke, Brooklyn, N. Y.

I claim as a new article of manufacture a return ball, A B, having a perforation, a', in which a musical reed, C, is placed, as described.

76,397.—HOT AIR FURNACE.—H. G. Burr, Minneapolis, Minn.

I claim, 1st, The arrangement and combination of the chambers, G H J and K, in a hot air furnace, substantially as shown and described.

2d, The annular flues, a and a', in combination with the chambers, H and K, as and for the purposes set forth.

76,398.—WATER CLOSET.—Wm. S. Carr, New York city.

I claim, 1st, The stationary overflow vessel, e, introduced within the upper end of the hopper, d, and receiving the lower end of the basin, f, in combination with the valve, k, on the spindle, l, and the flexible packing, h, applied to the lower end of the overflow vessel, e, in the manner and for the purposes set forth.

2d, The valve, k, attached to a plate and connected by the arms, 2 and 3, to the spindle, l, in combination with the flexible ring, forming a packing and seat for said valve, substantially as set forth.

3d, The spindle, l, for the valve, having a close bearing at one end, and formed with an arm, m, at the other end, and connected to and combined with the valve in the manner specified, so that the spindle can be inserted endwise, and connected with the valve, without disconnecting any of the parts of the hopper.

4th, The reversible screw bridge, t, formed as specified, in combination with the cup or socket, q, whereby the said cup or socket can be firmly secured to the varying thicknesses of wood work of the seat, as set forth.

5th, An elastic packing or seat for the valve, k, composed of a cylinder of vulcanized rubber, stretched upon the bottom flange of the overflow vessel, e, and forming a loose or free inner edge to receive the pressure of the superincumbent water in the overflow vessel, and form, with the valve, a water tight joint, as specified.

76,399.—POTATO-WASHER AND PAN COMBINED.—Joseph M. Chaplin, Morrisville, Vt., assignor to himself, E. E. Allen, and F. M. Loveland.

I claim the cylindrical potato washer, A, with its bars, C C, and movable hooked journal, H, in the one end, and lid, B, and crank, E, at the other end, when constructed and combined with the tin pan, G, as herein described, and for the purpose set forth.

76,400.—STOVE.—Joseph Collins, and John Knox, Conshohocken, Pa.

We claim the stove constructed as described, and consisting of the air chamber, C, fire back, D, having spaces, b, tubular sides, F, grate composed of single bars, E, bar, I, oven, B, and flues, f G h, all arranged as described.

76,401.—HAIR CRIMPER.—S. F. Conant, Skowhegan, Me.

I claim the series of spring plates, A A, pivoted together, substantially as described.

76,402.—SAP SPILE.—Williston Conner, Renselaerville, N. Y.

I claim, 1st, An improved sap spile, cast hollow, and with a circular flange, B, cast upon its inner end, said flange having its edge bevelled, and having two prongs, C, cast upon its inner side, substantially as herein shown and described.

2d, The combination of the inclined and notched arm or flange, D, with the body or stem, A, of the spile, substantially as herein shown and described, and for the purpose set forth.

76,403.—WATER CLOSET.—Hugh H. Craigie, New York city. Antedated April 1, 1868.

I claim, 1st, A pan, formed as a section of a globe, or nearly so, and mounted substantially as specified, so as to move nearly in the line of its own curvature, in combination with a water closet basin.

2d, A hollow arm, extending out on one side of the hopper, in combination with the pan fitted to be moved, as specified, by mechanism introduced within said arm, substantially as set forth.

3d, The combination of a pan, made and moving as specified, with a water closet basin, and metallic hopper extending up around said basin, as and for the purposes set forth.

4th, The annular water way, s, in combination with the deflector, u, with an opening through it, in the manner and for the purposes set forth.

76,404.—DEVICE FOR SCARIFYING THE SOIL PREPARATORY TO PLOWING.—Elisha Crane, Elkhart, Ill.

I claim, 1st, The truck frame, B B, where the same is provided with a series of parallel rods or axles, B' B', when the same are provided with a series of cutting blades or disks, b b, and the whole is constructed and arranged so as to operate substantially as described, and for the purposes specified.

2d, The truck, B, when the same is in combination with the uprights, a a, and wheels, a' a', and the whole is so constructed as to operate substantially as described, and for the purposes specified.

3d, The truck, B, rods or axles, B', cutting blades or disks, b, when the same is in combination with the windlass rollers, c c, and its operating mechanism, and the whole is so constructed and arranged as to operate substantially as described, and for the purpose specified.

4th, Arranging above the truck, B, when the same is provided with parallel rods or axles, B' L', and cutting blades or disks, b b, of the platform, F, and driver's seat, g, when the whole is so constructed and arranged as to operate substantially as described, and for the purposes specified.

76,405.—BRICK MACHINE.—William Chrighton, and Henry Roesler, Fort Wayne, Ind.

We claim, 1st, The rocking shafts, F F, in combination with bar, G, as and or the purpose described.

2d, The lifters, O O, operating as and for the purpose set forth.

3d, The combination of rocking shafts, F F, with lifters, O O, bar, G, and spring, q, substantially as set forth.

4th, The plungers, P P, provided with rollers, x x, rail, W, slides, p p, rocking shafts, F F, and lifters, O O, all combined and arranged as and for the purpose set forth.

76,406.—HARNESS OPERATING MECHANISM FOR LOOMS.—George Crompton, Worcester, Mass.

I claim the combination and arrangement, in a loom for weaving fancy or other goods, of a series of cams, when made as shown in fig. 5 of the drawings, with a series of jacks, G, having a series of notches, 6, substantially as and for the purposes set forth.

76,407.—BALING PRESS.—David Cumming, Jr., New York city, assignor to himself and J. C. Cameron.

I claim the combination of the eccentric wheel, F, in its movable bearings G G, with driving wheel, I, stud, N, follower, C, racks, E E, and pawls, H H, and L L, all arranged and operating substantially as set forth.

76,408.—SOLE-CUTTING MACHINE.—Timothy A. Curtis, Brookfield, Mass.

I claim, 1st, Securing the knife to the head, by means of the bolts, in connection with the racks and pinion, or other means of adjusting them, substantially the same, when constructed in the manner and for the purposes and operating substantially the same as above set forth and described.

2d, The adjustable gages, attached to head, C, substantially as described.

76,409.—INKSTAND.—Samuel Darling, Bangor, Me.

I claim, 1st, An inkstand, having an elastic ink-reservoir, C, a dipping cup, K, and a presser, F, constructed and operating substantially as described.

2d, An inkstand, having, in combination, an elastic or flexible ink reservoir, a pen dipping cup, and an intermediate ink chamber, arranged and operating substantially as described.

3d, An inkstand, having, in combination, an elastic ink reservoir, a follower, an intermediate ink chamber, and a pen-dipping cup, substantially as described.

76,410.—VISE.—Samuel Darling, Bangor, Me.

I claim a vise handle holder, constructed and to be applied to the handle, substantially as and for the purpose described.

76,411.—CULTIVATOR.—Elijah W. Dennis, Peoria, Ill. Antedated March 25, 1868.

I claim, 1st, The arrangement of the levers, I I, and cord, z, with spring, h, on the pole, M, substantially as and for the purpose specified.

2d, The arrangement of the levers, handles, H H, with the cord, x, and the pole, M, substantially as and for the purpose specified.

3d, The arrangement of the plates, s and t, as constructed, with the shovel, y, and bolt, w, for securing the shovel to the beam, substantially as and for the purpose set forth.

76,412.—CULTIVATOR.—G. W. Deweese, Lima, Ohio.

I claim the adjustable arms, C, and handles, a, combined with the draft beams of a cultivator, substantially as and for the purpose set forth.

76,413.—PROCESS OF EXTRACTING GOLD FROM ITS ORES.—Rudolph D'Heureuse, San Francisco, Cal.

I claim the process herein described for extracting gold, by passing gold-bearing substances, reduced to a fine powder, without previous alloy, through melted zinc, by introducing said substances below the surface of the melted zinc, as set forth.

76,414.—COMB.—Josiah S. Dickinson, Essex, Conn.

I claim, as a new article of manufacture, a comb-holder, A, constructed substantially as described.

76,415.—BRICK MACHINE.—Lewis Dieterich, Sandwich, Ill.

I claim, 1st, The followers, composed of the parts, D E, and F, in combination with the beams, H, guides, Z and S, and lever, P, substantially as specified.

2d, The arrangement of the bar, D, beam, H, pendants, I, and rock shaft, J, with the slotted or grooved bars, S, so that the operating parts can all be readily removed, substantially as herein described.

3d, The combination and arrangement of the lever, O, rock shaft, J, provided with the eccentrics, k, the removable standards, M, and pendants, I, guide bars, S, and followers, D E F, with frame, A B, all constructed and operating substantially as specified.

76,416.—APPARATUS FOR RAISING SUNKEN VESSELS.—Count Arthur Dillon, Paris, France.

I claim, 1st, The ballast compartments, B, with the hinged traps, D, for discharging the ballast from a submerged pontoon, substantially as and for the purpose shown and described.

2d, The apparatus, as shown and described, consisting of a cylinder, with pistons and generating chamber, for employing the buoyant force for raising the pontoon after it has been carried down in a latent state, all substantially as shown and described.

76,417.—COAL MINING MACHINE.—George Edmund Donisthorpe, Leeds, England. Patented in England, October 28, 1863.

I claim, 1st, The application of wedges to secure or hold the carriage to the rails, substantially as herein described; and

2d, The application of clearers or clearing instruments to the picks, or cutting tools, substantially as herein described.

76,418.—COAL MINING MACHINE.—George Edmund Donisthorpe, Leeds, England. Patented in England, March 8, 1866.

I claim the holding in position of the rails upon which machines used in getting coal and other minerals run by posts or pillars wedged or held between the floor and roof of the mine, substantially as herein described.

76,419.—COAL MINING MACHINE.—George Edmund Donisthorpe, Leeds, England. Patented in England, March 8, 1866.

I claim the so mounting the cutting apparatus of machinery employed in getting coal or other mineral, that the cutting apparatus may, while at work, rise or fall independently of the truck or carriage of the machine, substantially as herein described.

Also, the carrying the cutting apparatus on the top of the plunger of an air cylinder, carried by the truck of the machine, so that the cutting apparatus may cut a groove close up to the roof of the mine, substantially as herein described.

76,420.—EYE GLASS ATTACHMENT.—Julius Dorn, New York city.

I claim the combination of the springs, B d, and rigid nose piece, m, with the eyeglasses, as herein described, for the purpose specified.

76,421.—DEVICE FOR MOVING CARS.—Joseph Douglass, McConnellstown, Pa.

I claim, 1st, The combination of the lever, G, cap, C, and sliding check, H, when arranged so as to operate together substantially in the manner and for the purposes specified.

2d, The combination of the cap, C, spring, D, and blade, E, for the purpose of supporting and holding the other parts of the instrument in position, substantially as specified.

76,422.—DOUBLE-ACTING HINGE.—George Dumbolton (assignor to himself and C. H. Slicer), Baltimore, Md.

I claim the applying of two torsion springs to the swinging leaves or straps of a double action hinge, substantially as and for the purpose described.

76,423.—CABINET BEDSTEAD.—William H. Dutton, Philadelphia, Pa.

I claim, 1st, The straps, D, and curved bars, C, in combination with the parts, A B, of the bedstead, arranged and operating substantially as and for the purpose set forth.

2d, The adjusting or moving of the legs, E E, automatically, by the raising or lowering of the bedstead, through the media of the coil springs and cords, arranged substantially as shown and described.

76,424.—CAR REPLACER.—David Edwards, New York city.

I claim, 1st, The combination with the car, at or near either or both of its ends, of a transverse intermediate ground rest or bearing, capable of being raised or lowered, substantially as and for the purpose specified.

2d, The combination with a street or other railroad car, of the screw, E, screw box, G, and wheel or roller, H, the latter having its axis arranged transversely, or thereabouts, to that of the running wheels, and intermediately of the same, and capable of being raised or lowered, essentially as herein set forth.

76,425.—SPRING BED BOTTOM.—B. C. English, and Francis Fraps, Springfield, Mass.

We claim, 1st, The double slat or frame, A, consisting of top and bottom slats, C and D, with springs, E, between them, and connected at their ends by means of the blocks, G, screws, a, and washers, b, substantially as described.

2d, The arrangement of the frames, A, upon cross rods, B and B, so as to be adjustable by set screws, f, in the manner shown.

76,426.—LAMP BURNER.—Luther Erving, Brooklyn, N. Y.

I claim the arrangement of the foraminous case, C, cap, D, and perforated plate, b, with relation to the wick tube and base, all combined substantially as shown and described.

78,427.—POTATO-DIGGER.—Lewis Finch, Vienna, Va.

I claim, 1st, The double mold board, adjustable on the beam, B, and provided with horizontal and vertical cutting edges, as shown and described, and for the purposes specified.

2d, The combined arrangement of the double mold board, F F', convex share, C, and screen, D, all constructed and operating as and for the purposes specified.

3d, In combination with the above, the pivoted rake, H, for finally separating the potatoes from the earth, as described.

76,428.—ADJUSTABLE SEAT FOR CARRIAGE.—James Fleming (assignor to Gardner and Fleming), Philadelphia, Pa.

I claim the seat, G, hung to arms, E E, hinged to the body of a vehicle, in combination with guides or plates having stops, c c', e e', and secured to the body of the vehicle and to the seat, so that the seat is retained in its horizontal position both when adjusted to accommodate the driver and when adjacent to the dasher board as described.

76,429.—DEVICE FOR CONVERTING MOTION.—M. M. Follett, Westboro, Mass.

I claim the combination and arrangement of the devices, substantially as and for the purpose herein described.

76,430.—MOP-WRINGER.—M. M. Follett, Westboro, Mass.

I claim the squeezing roller frame, hinged to the oscillating post, and connected at its opposite end to the platform, by the adjustable connection described, all substantially as and for the purpose set forth.

76,431.—BOOT AND SHOE STRETCHER.—William Frederick, Pottsville, Pa.

I claim the combination of the lever, C, and screw, E, with the parts, A and B, of the last, substantially as herein shown and described, and for the purpose set forth.

76,432.—BENDING MANDREL.—Carlos French, Seymour, Conn.

I claim a mandrel, composed of an interior shaft, with a shoulder or recess therein, and an eccentric slotted clasp or sleeve on its perimeter, that can move over or past said shoulder, to catch and hold or release the end of the metal bent or wound therein, substantially as described and represented.

76,433.—MACHINE FOR PRINTING ADDRESSES OF NEWSPAPERS, ETC.—John C. Gaither, Somerset, Pa.

I claim the combinations of the following elements, viz., the treadle, I, the lever, L, and press rod, M, having an elastic faced point, M', the feed finger, O, the wheel, C, with an adjustable side plate, C', sector plates, G, type, D, wedges, E, and partitions, F, and the plate, N, with opening, N', said parts being arranged in relation to one another, substantially as and for the purpose set forth.

76,434.—BRACKET SHELF AND DRAWER.—Lewis Gibbs, Canton, Ohio.

I claim a bracketed shelf, with ornamented or plain railing or guard around its margins or edges, and with a drawer, substantially in the manner and for the purpose herein described and represented.

76,435.—REGISTER.—Harlow Gilbert, New York city.

I claim, 1st, The combination of the side plate, A, dial plate, B, thumb piece, C, milled or roughened roller, D, having one or more teeth formed upon it, gear wheels, F G H I, or their equivalents, horizontal gear wheel, J, and index finger, K, with each other, substantially as herein shown and described.

2d, In combination with the above, the tooth, L, on wheel, J, and the horizontal toothed wheel, M, arranged and operating substantially as described, and for the purpose specified.

76,436.—HARVESTER.—Alvaro B. Graham, Waukegan, Ill.

I claim the combination of the finger beam of a harvester, with a revolving shoe, through the intervention of friction wheels, substantially as before set forth.

Also, the combination of the finger beam, revolving shoe, and sliding arm of the bearing that holds the revolving shoe in place, substantially as before set forth.

Also, the combination of the members of a hinge joint, with a split tubular joint pin, substantially as before set forth.

Also, the combination of the joint pin of a hinge joint, with a spring holder and teat, substantially as before set forth.

Also, the combination of the bolt head or nut, with the spring latch and ratchet teeth, substantially as before set forth.

76,437.—COOKING RANGE.—William H. Graham, La Crosse, Wis.

I claim, 1st, The adjustable fire box top, F, constructed with a concavity on the under side of plate, h, for the purpose of allowing the products of allowing the products of combustion to pass from the chambers around the ovens to the pipe, substantially as described.

2d, The circular lid, P, provided with receptacles for cooking utensils, arranged in combination with fire box, F, of a cooking range, substantially as set forth.

76,438.—POTATO-DIGGER.—Alvah Graves, Marcellus Falls, N. Y.

I claim, 1st, The serrated wheel, D, when so constructed with relation to the riddle, C, that the lower portions of its teeth engage with the ground, to propel the wheel, while the upper portions engage in tossing the riddle, substantially in the manner and for the purpose set forth.

2d, The shovel plow, A a B F, hinged riddle, C c, and serrated wheel, D, all constructed, combined, and operating in the manner shown and for the purpose described.

76,439.—WHIRLIGIG TOY.—John Groves and E. B. Turner, Providence, R. I.

We claim the combination of a shaft with a piece of elastic, passing longitudinally through the handle of the toy, and operated substantially as described.

76,440.—PRINTERS' FURNITURE.—F. T. M. A. Guyon, Saint Brieux, France.

I claim, 1st, The part, K K, and the part, J J, arranged to operate relatively to each other and to the bed of a printing press, as and for the purpose herein specified.

2d, The tenons or spurs, k k, and screw, V, in combination with the readily adjustable frame, K K', J J, or its equivalent, the several parts being all arranged for joint operation, as and for the purpose herein specified.

76,441.—CLOTHES DRYER.—E. R. Hall, Utica, assignor to himself, D. M. Golden, Frankfort, and B. G. Eaton, Mexico, N. Y.

I claim, 1st, The springs, s s s s, for throwing out the arms, h h, substantially in the manner specified.

2d, The combination of the elevator, C, springs, s s s s, and arms, h h, substantially as and for the purpose set forth.

3d, Arms, h h, springs, s s, elevator, C, spools, e e, and tape or cords, f, all arranged substantially in the manner and for the purpose described.

76,442.—LINING OF FURNACES.—B. B. Haycock, Richmond, Iowa.

I claim a furnace of fireplace lining for steam boilers formed of clay, substantially in the manner herein shown and described.

76,443.—COMPOSITION FOR COVERING WOODEN BRIDGES, Buildings, etc.—Joseph Heckel and Michael Elchsinger, Decatur, Ill.

We claim the composition above described when compounded and used as and for the purposes specified.

76,444.—BASKET GRATE FOR FURNACES.—J. J. Heindl, New York city.

I claim the basket grate, C, having its sides, a a, constructed of inclined plates, partially or wholly closed, substantially as described.

76,445.—MODE OF PRESERVING GUNPOWDER.—E. E. Hendrick, Carbondale, Pa.

I claim the application, substantially as described, of any substance possessing the necessary hygroscopic properties, to the preservation of gunpowder, or other like substances, from injury by dampness.

76,446.—PORTABLE HEAD REST FOR CAR SEAT.—R. W. Heywood, Baltimore, Md.

I claim the combination of the regulating screw, D, with the hinged adjustable standard, B, which supports the head rest, and the clamp, A, and straps, G G, by which the apparatus is attached to the back of a car seat, when the parts are constructed and combined so as to operate together, substantially as and for the purpose specified.

76,447.—GANG PLOW.—W. F. Higgins and Jerome Perry Watsonville, Cal.

We claim, 1st, The combination of the inclined beams, I and K, braces or supporting bars, J and L, adjustable pivoted bar, M, and pivoted bars, H, with each other, with the plow frame F, sulky or wagon frame, A, and axle, B, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the lever, P, connecting bar, O, and arm, N, with the axle, B, and framework of the sulky or wagon, substantially as herein shown and described, and for the purpose forth.

76,448.—STEAM ENGINE PISTON.—J. Hinds, Salem, and G. H. Lodge, Swampscott, Mass.

We claim, 1st, In combination with an expansible cylindrical piston, as described, the detachable head, B', with elongated bolt holes, as described, or their equivalents, and connecting rod jointed to said piston head, substantially as set forth.

2d, In combination with the piston head and connecting rod, the tubular nut, C, lining plate, e, and eye bolt, d, screwing into the nut, C, and all arranged substantially as described.

76,449.—HORSESHOE.—Warner Hinds, Worcester, Mass.

I claim the horseshoe, complete in one piece, formed by the combination of the sole, A, with or without calks, the arms, B B, and clinches, l l, when constructed and operating in the manner and for the purposes above set forth and described.

76,450.—LAMP BURNER.—R. Hoadley and H. A. Shipman, Ansonia, Conn.

We claim the perforated plate, D, in combination with the deflector, H, and the base, B, when the said plate is arranged in the manner described, and constructed in one and the same piece with the vertical springs, E, and the chimney supporters, F, substantially as set forth.

76,451.—MACHINE FOR PICKING HAIR.—Ernst Hoffstaetter, New York city.

I claim the arrangement of the toothed cylinder, C, corrugated feeder, E and removable picker, D, with the hinged feed box, B, when the latter is provided with the springs, d h, whereby the hair is fed, either between the feeder, E, and picker, D, to the cylinder, C, or upon one side of the feeder, E, to the cylinder, without coming in contact with the picker, D, all constructed and operating as herein described, for the purpose specified.

76,452.—FANNING CHAIR.—A. R. Hobbs and N. F. Wright, Elizabethport, N. J.

We claim, 1st, A rockingchair, operating the fans, G, substantially as shown and described and for the purposes set forth.

2d, The back, B, and seat, C, in combination with the arms, D, and rock shaft, a, and spring, S, and frame, A, substantially as shown and described and for the purposes set forth.

3d, The arms, D, in combination with the notches, e, and pins, e', and seat, C, substantially as shown and described, and for the purposes set forth.

4th, The curved rack, D', and frame, A, in combination with the pinion, F, and shaft, E, and fans, G, and the seat, C, substantially as shown and described, and for the purposes set forth.

76,453.—SKATE.—James Holland, Brooklyn, N. Y.

I claim, 1st, The lever, e, and movable dog, h, in combination with the movable fulcrum, f, substantially as described.

2d, The movable dog, h, and movable fulcrum plate, f, in combination with the slot, c, substantially as shown.

3d, The ridge, i, on the lever, e, arranged substantially as shown, to draw the fulcrum plate down on the foot plate, substantially as described.

4th, The combination, substantially as described, of the lever, c, the movable dog, h, and trap, o.

5th, The arms, p, arranged on screw or fulcrum pin, m, for the purpose of raising the plate, f, free from contact with the foot plate, substantially as described.

76,454.—PEN.—J. H. Holland, Hancock, Mich.

I claim, 1st, The barrel, B, formed with holding lips, b', on the outside of its back, when provided with a projecting guide plate, C, adapted to receive the holder, D, which is adjusted by means of the screw, E, passing through a lug, d', attached to the holder, D, said screw being swiveled in the fixed projection, c', all constructed and operating as described for the purpose specified.

2d, In combination with the holders, B D, having lips, b', the pens, F G, when their lower ends are turned up, as described for the purpose set forth.

76,455.—COAL STOVE.—Elihu Hosford, Chicago, Ill.

I claim the grate, B, or its equivalent, for the purpose and substantialty as herein described.

Also, the combination of the cylinder, A, grate, B, ash box, E, air space, H, columns, F F, and hot-air chamber, G, for the purpose and substantially as herein set forth.

76,456.—HORSE COLLAR.—Ira Houghtling, Houghton, Mich.

I claim constructing a horse collar, perforated and lined with leather, as described.

76,457.—COPYING PRESS.—T. P. Howe, Brooklyn, N. Y.

I claim, as an article of manufacture, the improved copying press, hereinbefore described, made by combining the rigid cylinder, A, the elastic tubing B, and the blanket or cloth, C, substantially as hereinbefore set forth.

76,458.—PHOTOGRAPHIC TRANSFER.—Orrin P. Howe, Augusta, Me.

I claim removing from the iron plate its japanned or enamel surface containing the picture, using for that purpose strong alcohol or chloroform, or any other article equivalent thereto, and mounting the same upon cards in the manner and for the purpose set forth.

76,459.—BENCH OR TABLE.—L. D. Hubbard, Worcester, Mass.

I claim a wash bench or table in which the cross pieces, B, hinged legs, C, removable extending arm, E, and hook and eye, or equivalent means for holding the said legs in a folding position, are combined and arranged relatively to each other in the manner and for the purposes herein shown and specified.

76,460.—DIE FOR FORMING LETTERS AND FIGURES ON THE Edges of Type Blocks.—T. S. Hudson, East Cambridge, Mass.

I claim the combination of the sectional dies, b b b b, and block, A, spindle c, screw nut, D, and compresser or piston, E, and lever, L, the whole constructed and arranged substantially as and for the purpose set forth.

76,461.—ORE CRUSHER AND GRINDER.—Seymour Hughes, San Francisco, Cal.

I claim, 1st, An ore crusher, having the spiral inclined planes, B B, together with the stamps, N, and dies, E, the whole constructed and operating substantially as and for the purpose herein described.

2d, In a circular crusher and grinder, the inclined planes, consisting of the removable grinding plates, b, and the adjusting plates, a a a, substantially as and for the purpose described.

76,462.—LAMP SHADE.—S. W. Huntington, Augusta, Me.

I claim, as a new article of manufacture, a lamp shade composed of a sheet of wood or veneer, with a backing of mica, the two sheets being held together, as herein described, with or without an interposed layer of paper between them.

76,463.—MODE OF OBTAINING HEAT.—J. Johnson, Saco, Me.

I claim the application and use of a small but proper quantity of any liquid or solid, when inclosed within an air-tight case or form, for the purpose of receiving heat sufficient to convert it to steam or vapor, and in this state to act as a conveyer and transmitter of heat to other bodies for needed changes and by which transference the agent shall reform to liquid, to be again and again converted to vapor, carrying with it latent heat for the transmission.

76,464.—CORN HUSKER.—L. H. Johnson (assignor to himself and Chauncey Johnson), Branford, Conn.

I claim the herein-described corn husker, consisting of the hook, A, upon the handle, B, provided with the rests, C and D, substantially as herein described, as a new article of manufacture.

76,465.—STILT SKATE.—Wm. Jordan, Galena, Ill.

I claim, 1st, A skate, having the runner and foot piece united by a jointed connection, substantially as and for the purpose specified.

2d, The combination of the runner, a, supports, b and d, and foot piece, c substantially as and for the purpose described.

3d, The combination of the runner, a, supports, b and d, foot-piece, c, and vertical extensions, b' b', of supports, b, and strap, f, as described.

76,466.—DRAFT EQUALIZER FOR DOUBLETREE.—R. F. Judson, Kalamazoo, Mich.

I claim the combination of the staychains, or wood or leather braces, the curved levers, crossing each other, and united by a bolt, forming a joint, the iron clevis, with hooks on each side, and near each end of the same, the staple in the clevis, the kingbolt, the staple, attaching rear end of clevis to the wagon pole, the small whiffletree, with the wagon pole, for the purposes set forth and described.

76,467.—MACHINE FOR BORING WAGON HUBS.—J. T. Kendall, Concord, N. H.

I claim, 1st, The guide, h', in combination with the gage arms, c and c', the

set screws, f and f', the metallic frame-work, c', and the spring, g, substantially as described.

3d, The revolving table, k, with the arms or levers, p p p, and chucks, r, and ratchet wheel, n, and clamp, s'', combined and operated as described.

76,468.—RETAINER FOR NECK TIE.—W. J. Ketcham, Washington, D. C., assignor to himself and G. S. Prindle, Aurora, Ill.

I claim the within-described retainer for neck ties, consisting of the spring base or plate, A, and catches, B B, the latter provided with slots, D, and its ends meeting or overlapping each other, the whole arranged substantially as shown and described.

76,469.—SAWING MACHINE.—S. L. King, Lancaster, Pa.

I claim the construction of the rock shaft, J, with its adjustable screws, M, and regulating lever, N, as herein described, and for the purposes set forth.

76,470.—BRACELET.—C. M. Kinsel, Columbus, Ga.

I claim a bracelet so constructed as to be adjusted for wear as a finger ring substantially as described.

76,471.—SAW MILL.—J. L. Knowlton, Philadelphia, Pa.

I claim, 1st, The guides, F, slides, G, connecting links, l' l', pivoted levers, I I, and connecting rod, J, in combination with saw, H, all arranged and operating as described, for the purpose specified.

2d, The construction and arrangement of the segments, C D, the former having the opening, ax, for the purpose, substantially as described.

3d, The rack, l, and pinion, n, in combination with the sleeve, N, yoke, M, and feed rollers, Jx, as herein described, for the purpose specified.

76,472.—STEREOSCOPE.—W. M. Kohl, Cincinnati, Ohio.

I claim, 1st, The combination of the bent rod, j, screw, m, and pivoted levers, O O', with the plate, L, and lense tubes, J, all constructed, arranged, and operating substantially as described for the purpose set forth.

2d, In combination with the above, the right and left-hand screw, P, having head, o, and passing through lugs, n, attached to sockets, K K, as described for the purpose specified.

3d, The spring clamps, g, attached to the bars, G, of the picture holder, and constructed in the manner substantially as and for the purpose specified.

76,473.—MACHINE FOR ATTACHING SPANGLES TO HOOPS OF SKIRTS.—A. Komp, New York city.

I claim, 1st, Providing the edge of the rib, b, of the spangle guide with one or more projections, c, substantially as and for the purpose set forth.

2d, The arrangent of indentations or ridges, d, in the floor, a, of the spangle guide, substantially as and for the purpose described.

3d, The slotted rod, x, and pin, v, in combination with the slide, q, which carries the spring jaw, h, of the spangle carrier, substantially as and for the purpose described.

4th, The latch, y, in combination with the movable jaw, h, of the spangle carrier, substantially as and for the purpose set forth.

5th, The curved slot, m, stud, l, pin, o, and standard, p, in combination with the arm, k, and with the spangle carrier, substantially as and for the purpose described.

6th, The stops, c' d', to retain the spangle carrier at the extreme ends of its stroke, substantially as set forth.

7th, The secondary arm, k*, and spring, e', in combination with the main arm, k, of the lever, L, and with the hammer, H, and spangle carrier, D, substantially as and for the purposes described.

76,474.—MANUFACTURE OF TIN BOXES.—J. D. Lane, N. Y. city, assignor to Horace Everett, Philadelphia, Pa.

I claim the lower portion of a blacking box, having a flange turned up from and forming a part of the bottom, and that flange rolled and indented, all as described for the purpose specified.

76,475.—FENCE.—Chas. Lee, Sandy Postoffice, Ohio.

I have the uprights, b b, horizontal bars, a a', braces, J J, and pins, f', when arranged and combined with the panels, as set forth.

76,476.—HAIR CLOTH.—Isaac Lindsley, Pawtucket, R. I.

I claim the method herein described of uniting woven fabrics having a face of hair with an imperceptible joint, by stitching the fabric through where it is to be united, and while the hair face is in a semi plastic condition produced by saturation, flattening out and pressing, with protracted pressure, this sewn joint between metal or like surfaces while subjected to a suitable degree of heat to mold and set the hair face at the joint permanently, so as to produce an unyielding joint and an unbroken hair face at the joint, substantially as specified.

Also, as a new manufacture, a continuous web of hair cloth composed of two or more narrow webs, such as are usually woven from short hair weft, united after the sewing, molstening, and pressing process herein described, and in which a portion of the warp threads are removed before pressing, and the bights in the weft hairs of the united joint are bent and molded at right angles to the face of the fabric, and into or against each other, to conceal the joint, substantially as specified.

76,477.—ATTACHMENT FOR HEADS OF RAKES.—T. D. Little, Salisbury, N. H.

I claim the adjustable attachment for heads of drag rakes cumposed of the socket, a, brace, d, bolt and nut, b, and thumb screws, e, combined, constructed, and applied as above described.

76,478.—HAY PRESS.—G. W. Lockhart, Charlestown, Ind.

I claim the levers, H H, pivoted to the follower, G, when provided with the fulcrum rollers, a a, at about the center of their lengths, adapted to travel upon the horizontal platform, c, while their lower ends bearing the pulleys, c, are below said platform, all operating as described, for the purpose specified.

76,479.—PAPER DAMPENER.—J. A. Lynch, Boston, Mass.

I claim the combination of the filling tunnel with the cylinder and its cover by means of the link or arm, d, hinged to them, and so as to operate therewith, substantially as described.

Also, the arrangement of the stand with the cover and the cylinder, in manner as described and represented.

Also, the combination of the filling tunnel with the cylinder and its cover.

76,480.—HORSE RAKE.—Milton Alden, Auburn, N. Y.

I claim the keys, B, in combination with the tooth, C, and the holder, A, as set forth for the purposes described, whether used transversely, longitudinally, or otherwise, for said purposes.

76,481.—WASHBOARD.—F. E. Maberry, Haverhill, Mass.

I claim the soap reservoir, as above described, with the valve, H, and spring f, in combination with a corrugated washboard with openings, c, when arranged substantially in the manner and for the purpose specified.

76,482.—LAMP BURNER.—J. J. Marcy, West Meriden, Conn.

I claim the combination and arrangement of the straight rod, f, with the cone, C, and cap, A, when the said straight rod, f, is hinged directly or indirectly to the cone, substantially as and for the purpose specified.

76,483.—OIL CAN.—J. J. Marcy (assignor to E. Miller & Co.), West Meriden, Conn.

I claim the thimble, C, with its nozzle, D, arranged upon the spout, B, so as to turn thereon, and operate in the manner described, in combination with the vent valve, h, in the cover or can, all constructed so as to operate in the manner described.

76,484.—CHURN DASHER.—Mary E. J. Marr, Jefferson, La.

I claim the combination of a revolving dasher, as herein described, consisting of the spindle, A, and arms, C, provided with apertures or perforations, a, in combination with the removable socket block, B, when provided with wooden screws, b, or their equivalents, when each and all the connected parts are of wood, and are constructed, arranged, and operate substantially as and for the purposes herein set forth.

76,485.—WELL TUBE.—Wm. Martin, Tarr Farm, Pa.

I claim the point, A, having the socket, S, the ears, E E, and the broad shoulders, a a, in combination with the tube, B, having the longitudinal slots i i, and with the rivets, r r, operating in the slots, i i, substantially as and for the purpose described.

76,486.—GRAIN-SCOURING APPARATUS.—P. H. Massey, South Bend, Ind.

I claim, 1st, The combination of the hopper, H, shaft, h, provided with the scouring disks, n, spout, E, chamber, C, with the inclined partition, b, and fan, B, when said parts are constructed and arranged for joint operation, substantially as described.

2d, The use, in apparatus, constructed substantially as described, of the detachable inclined bottom, i, and the removable tubes, v and v', for the purpose as herein described.

76,487.—DORY-BOAT KNEE.—E. G. Matthews, Boothbay, Me.

I claim a dory boat knee in which the wooden parts, A A, are combined with the metal supporting plates, B B, provided with the flanges and guards c c e, under the arrangement and for operation as herein shown and specified.

76,488.—LEAD AND SLATEPENCIL CASE.—T. B. McCaughan, Moscow, Tenn.

I claim the combination of the case, A, ferrule, C, and rod, E, attached to the sliding band, D, all arranged substantially as and for the purpose specified.

76,489.—FISH TRAP.—T. B. McCaughan, Moscow, Tenn.

I claim the loaded or weighted lever, D, at the upper end of the upright, A, in connection with the horizontal pole, B, line, E, and the bent rod, g, and pin, f, or their equivalents, all arranged substantially as and for the purpose herein set forth.

76,490.—TOOL FOR OPENING CANS.—M. T. McCormick, Meadville, Pa.

I claim the shaft, B, in combination with the arm, G, the knife, H, and the set screws, D D, when the same constructed in the aforesaid combination, for the purposes set forth.

76,491.—TENON FOR BLIND SLATS.—Wm. McFarland, N. Y. city, assignor to himself and John H. Campbell.

I claim the tenor, C, constructed with a beveled shoulder, E, and fastening plate, D, substantially as and for the purposes set forth.

76,492.—APPARATUS FOR ASSORTING COIN.—J. W. Meaker, Chicago, Ill.

I claim, 1st, The assorter, B, with an open front, and provided on its interior rear side with the guides, g and h, forming an inclined way, constructed and arranged for use, substantially as shown and described.

2d, Operating the follower, b, by means of a spring, C, applied externally, substantially as described, and for the purposes set forth.

3d, The slide, E, provided with the end piece, k, and pawl, m, constructed and arranged to operate substantially as described and for the purposes set forth.

4th, Providing the slides, E, with springs, so that one or more of the slides may be operated automatically at the same time, substantially as described, and for the purpose set forth.

76,493.—APPARATUS FOR ASSORTING COIN.—J. W. Meaker, Chicago, Ill.

I claim, 1st, The drawer, B, with the tube, I, having flanges, e, in combination with the arm, B, spring, d, and follower, a, constructed and arranged to operate substantially as described and for the purpose set forth.

2d, The stationary post, E, in combination with the sliding tube, C, with flanges, e, slot, o, and register, constructed and arranged to operate substantiallo as described and for the purpose set forth.

3d, The form, F, in combination with the sliding cover, g, constructed substantially as described and for the purpose set forth.

4th, In a coin assorter, an inclined way G, having the sides of the openings, J, forming the angle, I, inclined so as to deliver the coin below the upper line of the next opening, substantially as described.

5th, In a coin assorter an inclined way, C, having the openings, j, so arranged that the gravity of the coin will tilt them, and provided with a slit or lip, q, bent upward, for the coin to run under, and secure their tilting and delivery, substantially as described.

76,494.—CAR COUPLING.—John W. Melcher, Oshkosh, Wis.

I claim the disk, c, in combination with the groove, g, guides, d d, and springs, S S, in connection with the pin, e, draw head, a, and link, f, when arranged and constructed substantially as described.

76,495.—APPARATUS FOR FILTERING SUGAR.—Wm. H. Merrick, Philadelphia, Pa.

I claim the nipple, B, constructed substantially as described, for adaptation to an opening in the partition, A, large enough to admit of the passage thro' of the bag attached to the nipple, all substantially as and for the purpose herein set forth.

76,496.—CARRIAGE POLE.—V. N. Mitchell, Concord, N. C.

I claim the improved carriage pole, formed of two pieces of timber, a a, firmly secured together at the front end, and spread and curved downward at the hind ends, to prevent said pole from coming in contact with the elliptic springs, C, when the vehicle is turned, as herein shown and described.

76,497.—CHURNING APPARATUS.—E. J. Moore, Westfield, N. Y.

I claim, 1st, The combination of the bars, G and H, adjustable lever, D, and adjustable dasher handle, B, with each other, substantially in the manner as shown and described and for the purpose set forth.

2d, The combination of the adjustable balance weight, I, with the lever, D, substantially as herein shown and described, and for the purposes set forth.

3d, The combination of the weighted lever, J, or its equivalent, with the bars, H, or forward part of the lever, D, substantially as shown and described and for the purpose set forth.

76,498.—SLEIGH RUNNERS AND MODE OF ATTACHING THEM TO THE AXLES OF VEHICLES.—J. C. Moore, Madison, Ind.

I claim, 1st, The forked standards, D D, with the eyes, a a, in their upper ends, when used for the purpose and in the manner as specified.

2d, The step, C, when used in combination with the runner, A, for the purpose and in the manner as set forth.

76,499.—MANUFACTURE OF NITRO-GLYCERIN.—George M. Mowbray, Titusville, Pa.

I claim the process of manufacturing nitro-glycerin by the use of compressed air, artificially dried and cooled nitric acid, sulphuric acid and glycerin, substantially as described.

76,500.—MODE OF LOCKING NUTS.—Wm. Mullins, Pittsburg, Pa.

I claim the improved device for locking nuts, consisting of a metallic pin placed under the nut, in a groove in the surface against which the nut is screwed, and turned up so as to embrace the nut, substantially as hereinbefore described.

76,501.—HORSESHOE.—Patrick Murray, East Morrisania, N. Y.

I claim a steel horseshoe with two continuous or nearly so calks, 1 and 2, the former more prominent or projecting and with more bearing surface than the latter, so as to take the main support and wear while the latter continues sharp and efficient as an auxillary calk to prevent slipping, substantially in the manner described.

76,502.—PASSENGER REGISTER.—A. F. Nagle, Providence, R. I.

I claim the step, A, in combination with the pawl, G G, the ratchet wheel, G, the shaft, F, the cog wheel, H, the rollers, I I I, and the band, K K, or their separate equivalents, arranged substantially as described and for the purpose specified.

76,503.—HOSE COUPLING.—Peter H. Niles, Boston, Mass.

I claim, 1st, A segment nut in combination with the perforated hose, substantially as described.

2d, A segment nut and the perforated hose in position, in combination with the shank of the coupling, in the manner and for the purpose substantially as described.

76,504.—BRICK MACHINE.—Clinton Nolan, Niles, Mich.

I claim the combination of the parallel hinged arms, E, pivoted nuts, D, straps, H, weighted lever, I, and stands, S, with the shaft, B, arranged substantially as described for the purpose specified.

76,505.—COMBINED CLAY GRINDING AND SEPARATING MILL.—F. B. Norton and F. Hancock, Worcester, Mass.

We claim, 1st, The combinaton with a perforated potters' clay grinding cylinder of a separating sieve and sieve holder, substantially as and for the purposes set forth.

2d, The combination, with the perforated clay grinding cylinder, B, separating sieve, b, and sieve holder, C, of the rotary grinding arms, E, provided with one or more lips, e, substantially as and for the purposes set forth.

76,506.—HAY ELEVATING APPARATUS.—Joseph F. Nugent, Cannonsburg, Mich.

I claim, 1st, The stop, e, of the draft rope, C, in combination with the carriage, B, and the track, A, operating substantially as and for the purpose specified,

2d, The arrangement of the three pulleys with their accompanying pawls and ratchets upon the carriage, B, and in relation with the draft rope, substantially as and for the purpose specified.

3d, The combination of the lever arm, n, crank arms, n' n*, connecting rod F, and studs, s, with the pawls and ratchets of the pulley, a b c, of the carriage, B, substantially as and for the purpose specified.

76,507.—HARNESS.—Robert O'Brien, Towlesville, N. Y.

I claim the combination of the bridle, C, plates, D and G, hames straps, O, bars, Q, and saddle, R, with the looped pintles, E K T, and straps, I Z, arranged and operating as herein described for the purpose specified.

76,508.—KILN FOR DRYING MALT.—Christian Oefinger and Sebastian Grupp (assignors to themselves and Henry Stempleman), San Francisco, Cal.

We claim the openings, D D, for the passage of cold air to the chambers, C, in which the hot and cold air are combined, and the pipes, E E E, provided with caps or valves, E', for conveying it to different parts of the perforated plate, the whole constructed and arranged substantially as and for the purpose specified.

76,509.—VITRIFIED COMPOUND.—James O'Friel, Blair County, Pa. Antedated March 28, 1868.

I claim the composition herein described, prepared in the manner set forth.

76,510.—MACHINERY FOR THE MANUFACTURE OF GUNPOWDER.—Paul A. Oliver, New York city.

I claim a machine for crushing, grinding and incorporating together the ingredients for the manufacture of gunpowder, composed of a series of rollers placed in pairs, one pair above another, and a lower pair one or more of toothed rollers, all arranged to operate substantially as shown and described.

76,511.—HORSE HAY FORK.—James O'Rouke, Columbiana, Ohio.

I claim handle, g, lever, h, and bar, C, combined and operated as and for the purpose specified.

76,512.—TATTING SHUTTLE.—E. N. Parker, Essex Center Brook Post Office, Conn.

I claim as a new article of manufacture a tatting shuttle having its sides enclosing the revolving tube, c, and spool, d, and its perforated ends riveted together and to the blocks having the tension holes, g h, all constructed as herein shown and described.

76,513.—STRAW CARRIER.—Wm. Parker, Washington, O.

I claim, 1st, A series of open or riddle like bars, substantially as and for the purpose set forth.

2d, A series of bars, operated with one crank shaft only, substantially as and for the purpose set forth.

3d, A series of bars curved substantially as and for the purpose set forth.

4th, A series of bars provided with horns, substantially as and for the purpose set forth.

76,514.—COFFEE POT.—James Willard Patterson and Joseph Stackey Hill, Cincinnati, Ohio.

We claim the combination of the vessels, A and B, and coil, E, when so arranged that the pipe may be made to discharge into either vessel at will, substantially as and for the purpose set forth.

76,515.—FENCE POST.—Garrett R. Patton, Juda, Wis.

I claim a metallic base or support for posts, consisting of the socket, B, spreading legs, C, and cross bars, D, arranged and constructed substantially as herein described.

76,516.—ROOF STAGING.—Chester M. Pease, Monson, Mass.

I claim the plank, A, provided with the claw, C, hold fast, D, and rack, B, in combination with the bar, E, connected to A by a joint, f, and leaving a support, F, attached to it by a joint, g, the lower end of F being provided with a forked plate, G, to catch into the rack, and arranged in the manner as and for the purpose set forth.

76,517.—CONNECTING LINK.—Wm. N. Pelton, New London, Conn.

I claim a connecting link, consisting of the body, A, and of the bar, B, pivoted to the same, all made and operating substantially as described, for the purpose specified.

76,518.—HORSERAKE.—Charles B. Perkins, Kenduskeag, assignor to himself and Barnabas Burseley, Sangerville, Me.

I claim lever, G, knees, L, friction roller, K, and lifting roller, H, constructed, combined and arranged substantially as described.

76,519.—WRENCH.—A. S. Petrie, Hudson City, N. J.

I claim the obliquely grooved or ribbed sliding key, C, in combination with the movable jaw, B, and the obliquely grooved or ribbed shank, A, substantially as and for the purpose specified.

76,520.—CAR REPLACER.—Nathaniel Pullman, New Oregon, Iowa.

I claim, 1st, The shoe, B, constructed in two parts, with parallel and diverging slide, and having clamps, b3, and bolt, b, substantially as described.

2d, The shoe, C, constructed with parallel and diverging sides, the outer of which is higher than the inner, as and for the purpose described.

3d, The combination of shoes, B C, rails, D D', E, when constructed as described, adapted to the rails, A A, and operated substantially as set forth.

76,521.—ELECTRO-MAGNETIC LOG.—W. I. Reid, Brooklyn, N. Y.

I claim the log, provided with a break for closing and breaking the electric circuit, substantially as described, in combination with the registering instrument connected therewith by an electric conductor, the said registering instrument being provided with an escapement operated by an electro-magnet, and with the means described, or equivalent means, for registering, all substantially as specified and for the purpose set forth.

76,522.—HARVESTER.—Stephen Rex, Orefield, Pa.

I claim the locking pawl, e, lifting lever, a, and spring, f, substantially as shown and described, when combined with any toothed wheel of the gearing, operating the cutters or knives of a reaping or mowing machine, all as and for the purpose set forth.

76,523.—PLATFORM SCALE FOR WEIGHING.—Wm. W. Reynolds (assignor to Howe Scale Co.), Brandon, Vt.

I claim the combination of the two-yoke levers and their wheels and caster, or the equivalent of the latter, with the platform scale, the whole being arranged and to operate substantially as described.

76,524.—WAGON WHEEL.—Paris Richardson, Jr., Warren County, Ill.

I claim a wagon wheel having a felloe, B, case of one piece of metal, and a hub composed of the metal part, F, and cap, D, with grooves, b, and wedge spindle, G, all connected and arranged substantially as and for the purposes set forth.

76,525.—ROTARY STEAM ENGINE.—Matthias Rikert, Oneida, Ill.

I claim the arrangement of the stop or partition block, O, pistons, E E E, trams, G G, and cams, H H, and standards, I I, substantially in the manner and for the purpose as herein shown and described.

76,526.—VALVE ROD CONNECTION.—John Robertson, Quincy, Ill.

I claim the sleeve nut, B, arranged substantially as shown, whereby a valve rod or connecting rod may be adjusted without turning the same, substantially as described.

76,527.—FIRE ESCAPE.—Azariah Robinson, New York city.

I claim the arrangement of the chair, C, with relation to the rope, B, and crane, A, whereby the chair, by its hook, d, is adapted to be kept free from contact with the flames escaping through the lower windows of a burning building, as herein described for the purpose specified.

76,528.—BALANCED SLIDE VALVE.—William B. Robinson, Detroit, Mich.

I claim the balanced slide valve, constructed as described, having the perforated side recesses, B, adapted to receive the single packing strip, C, having different surfaces, forming recesses, the inner recess communicating with the interior of the valve through the openings, c, and the ends of said valve having perforated recesses, D, containing the double packing strips, the inner one, F, of which is formed in one piece, and the outer one, E, of two pieces, held apart by the spiral spring, the recesses in the ring, F, also communicating with the interior of the valve through the openings, s, all constructed, arranged and operating as herein described, for the purpose specified.

76,529.—GRAIN CONVEYER.—J. M. Rush, Marengo, Iowa.

I claim the sliding frame combined with the disk, d, and the flights, a a, on the shaft, B, arranged and operating substantially as and for the purpose herein described.

76,530.—SAP SPOUT.—J. B. Sargent, New Haven, Conn.

I claim, 1st, A sap spout, constructed with the hollow screw shank, B, having formed in the shank, between the screw and the base of the spout, the chamber, C C, in the manner and for the purpose set forth.

2d, A sap spout provided with the packing, a, around the shank, in the manner and for the purpose substantially as herein set forth.

76,531.—SHAFT COUPLING.—Anson Searls, New York city.

I claim, 1st, A shaft hook made eccentric in form, with a bolt hole through it, and the recess, B, in the front side, as shown.

2d, An eccentric cap, C, with the recess, D, for the purposes set forth.

3d, The cap, C, spring, E, cap, H, nut, F, and bolt, I, in combination, and in combination with the hook, A, and pin, K, substantially as described and for the purposes set forth.

76,532.—FRUIT DRYER.—M. A. Shepard, Bridgeport, Ill.

I claim the furnace, B, when constructed as described, and hot air chamber, D', arranged as described, in combination with the safe, A, the whole being so constructed that the two latter can be readily detached from the furnace when desired, and used for other purpores, as set forth.

76,533.—SPOOL STAND.—Jos. H. Simmonds, Philadelphia, Pa.

I claim, 1st, The combination of the body, D, spool spindles, F, arms, C, and support, A B, substantially as described, for the purpose specified.

2d, The spring, C, supporting the closed body, A, when constructed and operating substantially as desbribed and for the purpose specified.

76,534.—STEAM HEATER.—Wm. Simpson, Rosherville, and Wm. Howitt, Notting Hill, England.

We claim constructing arched or curved frames for the roofs of horticultural and other buildings, wholly or in part of metallic tubes, D, united by curved sockets, E E', and so connected and arranged as to permit and facilitate a circulation of hot water through the same, all substantially in the manner and for the purpose herein set forth.

76,535.—APPARATUS FOR GENERATING GAS.—William M. Sloan, Buffalo, N. Y., assignor to Car Carpenter.

I claim the combination of the carbureting apparatus, A B D, when constructed and operating as described, with the fire chamber, I, cylindrical retorts, L L1 L2, etc., etc., and pipe, E, when the parts last mentioned are arranged in the manner set sorth, the whole operating together shbstantially as and for the purpose specified.

76,536.—WRENCH.—E. A. Smead, Tioga, Pa.

I claim the cam, e, for holding the sliding jaw, C, as herein specified.

76,537.—IMPLEMENT FOR CUTTING, PERFORATING, AND LIGHTING CIGARS.—Charles F. Smith, Springfield, Mass.

I claim as a new article of manufacture the stand, B, with match box, C, burner, A, and cutting device, D 1 d, the whole constructed and arranged substantially as and for the purposes set forth.

76,538.—AMALGAMATOR.—Robert Smith and Wm. T. Smith, Carondelet, Mo.

We claim, 1st, The amalgamating troughs, B B', when their bottoms are serrated, and acute angles, b', formed at the back end of each serration, as described and set forth.

2d, The combination of two or more sets of amalgamating troughs, B B', with the delivery flume, C, and distributing aprons, D E, substantially in the manner and for the purpose herein shown and described.

3d, The swivel guide blocks, c and d, when applied to the flume, C, and apron, D, as described and set forth.

4th, The arrangement of the shafts, I, with their handles, i, and levers or arms, I', when employed as herein described and shown.

76,539.—LEMON SQUEEZER.—Thos. C. Smith, N. Y. City.

I claim, 1st, Providing the interior of the cup, B, with a shoulder, a, to receive a ring, f, of india rubber, or other suitable elastic material, on which the flange, e, of the concave, G, rests or bears, in connection with the lips, g g, at the upper part of the cup, B, and the notch, h, in the flange, e, of the concave, all arranged substantially as shown and described, for the purpose of securing and packing the concave in the cup.

2d, The combination of the cast-metal handles, A A', plate, E, and cup, B, with the porcelain compress, F, and concave, G, the two cast-metal parts being connected by a hinge or joint, and the porcelain parts attached to the cast-metal parts, substantially as shown, for the purpose set forth.

76,540.—BRICK FOR BUILDING PURPOSES.—Wright Smith, St. Louis, Mo.

I claim the brick, A, when provided with the dove-tailed mortar cavities, a, extending across a portion only of the depth of the brick, the same being in shape flaring at the bottom and narrower at the top, substantially as and for the purpose described.

76,541.—MODE OF LUBRICATING AXLES.—Jacob L. Sorber, Chillicothe, Ohio.

I claim, 1st, The combination of the tubular spindle, B C, elevated oil reservoir, D, taps, E, ducts, F F', and annular oil chambers, J J', as and for the purposes specified.

2d, Providing the inner end of a wheel hub with the outwardly flaring sand and mud guard, I, for the purpose described.

3d, Attaching the bar or block, M, to the axle in the rear of the collar, a, for the object explained and set forth.

76,542.—DRAW BRIDGE.—Thos. S. Speakman, Camden, N. J.

I claim a bridge, constructed with the widened parts, D D, with the channel, C, between them, and having two connecting draws, G G', that span the channel, one at the upper and the other at the lower side of the bridge, substantially as and for the purpose specified.

76,543.—MACHINE FOR POLISHING THE HEELS OF BOOTS AND SHOES.—Vivian K. Spear, Lynn, Mass.

I claim, 1st, In combination with the boot-holding bracket, mounted on a sliding base-plate, the lever, G, with ratchet, pawl, and connecting-rod, I, substantially as and for the purpose described.

2d, In combination with the sliding bracket, lever, G, connecting-rod, I, and ratchet and pawl, the forked lever, L, spring, l, and connecting-rod, J, substantially as and for the purpose set forth.

3d, In combination with the boot-holding bracket and polisher, as described, the clutch, R, with the central point, r, and flange, r', substantially as and for the purpose specified.

4th, In combination with the bracket and polisher, the attachable and detachable button, q, as and for the purpose described.

76,544.—COMPOSITION FOR PURIFYING ILLUMINATING GAS.—Wm. H. St. John and Peter Cartwright, New York City.

I claim the process of purifying illuminating gas, made from bituminous coals, by transmitting it through a composition of pulverized iron ore, strengthened to about eighty per cent of pure metal, moistened with ammoniacal liquor, and mixed with about five per cent of pulverized charcoal, and prepared as more fully set forth above.

76,545.—STEAM ENGINE SLIDE VALVE.—Jerome Stocking and Edward P. Shaffer, Rochester, N. Y.

We claim the combination of the fixed nut, g, screw-head, h, with the double-seated valves, E and F, whereby the seats of the valves are allowed to work freely, irrespective of expansion and contraction of the steam chest, substantially upon the principle as herein set forth.

76,546.—CARRIAGE BOLT.—James Strawn, Plymouth, Mich.

I claim the combination of the clip, c, with the bolt, d, the latter being loose in the former, as and for the purpose described.

76,547.—CLOTHES PIN.—A. L. Taylor, Springfield, Vt.

I claim the combination of the hook or fastening, B, with an ordinary clothes pin, A, when the fastening is constructed and applied to the outer side of the pin, substantially as herein shown and described.

76,548.—BALING PRESS.—Enoch Taylor, Memphis, Tenn.

I claim the arrangement of the upper platform, B, lower platform, N, working upon the posts, O, connecting-bars, M, toothed segments, L, worm, K, and the gearing, D E G H, and crank wheel, J, all operating as described, for the purpose specified.

76,549.—MATCH STAND.—George G. Taylor, Charlestown, Mass.

I claim, as an article of manufacture, a safe for matches, containing the drawer, H H, and the movable pan, I I, with the two chambers formed therein, and either made of or lined with metal, together with an igniting surface, N N, on one side thereof, the whole constructed in the manner and for the purposes substantially as set forth.

76,550.—HORSE HAY FORK.—Truman H. Tears, Le Roy, Pa.

I claim the arms, A B, when constructed in the manner and for the purpose substantially as herein set forth.

Also, the combination of the arms, A and B, link, D, pulley, F, and pin, H for the purpose and substantially as herein described.

76,551.—MUSIC RACK.—George Tefft, Salem, N. Y.

I claim, 1st, An improved music rack or machine for turning music, constructed in the manner and for the purposes substantially as herein described and set forth.

2d, I claim the notched levers, C C' and CC'', and the cog-wheels, H H' and H'', and the cylinders, D D' and D'', in combination with and operating the leaves or folds, O, of a music rack or frame, substantially as hereinbefore fully described and set forth.

3d, The upright or bar, B, and the cylinders, D D' and D'', and levers, C C' and C'', in combination with a music rack or frame, substantially as herein fully described and set forth.

4th, The combination of the levers, C C' and C'', operated by the springs, E E' and E'', and F F' and F'', with the cog-wheels, H H' and H'', cylinders, D D' and D'', and upright or bar, B, each being constructed and operated in the manner and for the purposes substantially as herein fully described and set forth.

76,552.—HYDROCARBON BURNER.—Frederic William Thayer, Boston, Mass.

I claim, 1st, The combination of one or more elongated projecting jet pipes with the evaporator or retort, when they are so proportioned to each other that, by means of the evaporation alone, the vapor will be discharged from said pipes with force, so as to produce an elongated jet of flame, similar to that of the blow pipe, substantially as described.

2d, The jet pipe, supplied with gas or vapor, as described, in combination with the adjustable mixing pipe or chimney, by which a current of air is drawn into the same, and mixed with the jets of vapor, substantially as described.

3d, Combining with the retort or evaporating vessel the air chamber, for heating the air supplied to the jets and protecting the vessel, substantially as described.

4th, So combining the chimney with the heating chamber and jet pipe that it is supported by the upper wall of the chamber in proper relation to the jet pipe, so as to receive from the chamber the proper amount of air to supply the jet, substantially as described.

5th, Adjusting the chimney and jet pipe by means of the nuts, a, in combination with the air chamber, substantially as described.

6th, The employment of two or more retorts, one over the other, and the heating of the uppermost retort by jets supplied by the retort beneath it, substantially as described.

76,553.—BEDSTEAD.—William L. Thomas, Middlebury, Ohio.

I claim the bedstead, constructed as described, and consisting of the side rails, B, strips, D, end rails, C, posts, A, slats, F, having pins, G, springs, E, hinged section, F H, also provided with spring slats, F F G, arms, I, straps, J, shaft, K, ratchet and pawl, M N, and crank, L, when said side rails, B, are provided on the inner face with guides for the ends of the spring slats, F, all arranged and operating as set forth.

76,554.—ATTACHMENT TO COOKING STOVES.—John Thornley, Fallston, Pa.

I claim, as an article of manufacture, a cast or sheet-iron drum box, so made as to form an extension of the top of a cook stove, and provided with shelves at the sides, a boiler hole on the top, and adjustable wing gates in the flue chamber, and connecting a cook stove flue with a chimney, substantially in the manner and for the purpose described.

76,555.—MEDICAL COMPOUND.—W. P. Thurber, Chicago, Ill.

I claim the improved medicine prepared of the material and substantially as herein set forth.

76,556.—CUTTER HEAD FOR WOOD PLANING MACHINES.—Thomas Tostevin, Council Bluffs, Iowa.

I claim the cutters, B, having an outwardly-projecting flange upon their rear edges, and the caps, C, provided with a series of parallel longitudinal grooves in their under sides, constructed to operate substantially as described.

76,557.—VOLUTE SPRINGS.—Joseph Trent, Millerton, N. Y.

I claim, 1st, As a new article of manufacture, the quadruple volute spring, constructed in the manner herein set forth.

2d, The improved method herein described of manufacturing double or quadruple volute springs.

76,558.—BRIDGE.—L. E. Truesdale, Chicago, Ill.

I claim, 1st, The construction and arrangement of the corrugated clamp plates, H, in combination with the tie rods, S'', in the manner and for the purpose herein described.

2d, The construction and arrangement of the caps, A and A'', and posts, B, of a bridge so that the suspension rods may be clamped together by means of the corrugations upon the ends of the same, and held firmly in position by means of clamp, E, and wedge or key, I, substantially in the manner and for the purpose herein described.

76,559.—RAILWAY SIGNAL AND ALARM.—A. C. Twining, New Haven, Conn.

I claim, in a railroad draw or other opening, the locking apparatus, constructed and operating substantially as described, when connected with the described devices for actuating the brake, bell or whistle, upon the engine of a moving train, all substantially as set forth.

In combination with the above also the handle, h, connected and arranged as described, to strike on the successive inclines, substantially as and for the purpose set forth.

76,560.—BRIDGE.—John B. Valliquette, Chicago, Ill.

I claim the gates, G G, arranged to run in slots, H H, in combination with the tracks, J J, projections, e e, and rubber blocks, X X, substantially as and for the purpose set forth.

76,561.—WINDMILL.—J. H. Van Nortwick, Sturgis, Mich.

I claim the combination and arrangement of wind wheel, m, wings, n n, pinions, s s, wheel, H, lever, E, spring, a, and plate, p, or its equivalent, substantially for the purpose described.

76,562.—CHAIN LINK.—Samuel Vanstone (assignor to himself and John Stewart), Providence, R. I.

I claim constructing the two divisions of a connecting link, in the manner substantially as described, for the purposes specified.

76,563.—LIME KILN.—Michael Verhoeven, Rochester, N. Y.

I claim the construction and arrangement of the furnaces with the removable grate bars, d, angular diffusing sides, g g g', lateral passages, C 1, and double arches, k k', with intervening air space, 1, the whole operating in the manner and for the purpose herein set forth.

76,564.—STOVE DRUM.—Jacob Voegtle, Indianapolis, Ind.

I claim a heat regular, having cylinders, F E and D, damper, a, rings, B and H, and plates, C G and K, constructed, arranged and combined substantially as and for the purposes herein specified.

76,565.—COAL STOVE.—Felix Walker, Memphis, Tenn.

I claim the egg-shaped stove, A, having an open bottom, the bed plate, B, and chamber, C, in combination with the semi-elliptical reflecting niche, F, all arranged as described for the purpose specified.

76,566.—SHINGLE MACHINE.—Wm. H. Walker, Fond du Lac, Wis.

I claim, 1st, The combination of the wheel, G, provided with the cam, m, and the sliding carriage, provided with the friction rollers, l, or equivalents, all constructed and arranged to operate substantially as described.

2d, Operating the dogs, p, by means of the inclined bar, b', sliding box, N, and lever, u, operated by cam, P, substantially as set forth.

3d, The forked lever, T, pivoted upon the main frame, A, and arranged to be operated by the carriage, L, for the purpose of raising the blocks from contact with the saw, substantially as described.

4th, Locating and carrying the tip tables, O, with their cam shafts, on the saw carriage, L, substantially as shown and described.

5th, The metal dogs, f', secured to the wooden head blocks, l', when arranged in the metal frames, D, as set forth.

76,567.—CLOCK ALARM.—C. H. Warner, New Haven, Conn.

I claim, 1st, The cam, F, and lever, G, with the dial, B, when the said cam is arranged to operate the lever, G, once only during two revolutions of the dial, B.

2d, The combination of the lever, G, and the hammer, X, with the lever, G, when arranged so that the hammer, X, operates the lever, g, in the manner and for the purpose described.

3d, The combination of the cam, U, and the cam or pins upon the shaft, a, with the lever, g, and its arm, h, arranged so as to operate in the manner described.

76,568.—CORPSE PRESERVING CASE.—Joseph S. Waterman, Roxbury, Mass.

I claim making the ice box, B, adjustable within the case, A, so that it can be raised or lowered to increase or diminish the size of the corpse chamber, for the purposes described.

76,569.—CHAIR SEAT.—G. A. Watson, Proctorsville, Vt.

I claim the securing of bottoms in chairs by having grooves, a, made in the upper surface of each rail, b, of the seat frame, and having strips, B, to fit in said grooves to clamp and firmly hold the edges of the bottom in the grooves, the strips being drawn into the grooves, and firmly secured in position by screws, d, or other means, substantially as set forth.

76,570.—SOFA BEDSTEAD.—Julius Werner, New York city.

I claim, 1st, The combination of the back, D, upholstered upon both sides and hinged at the base, with the seat, C, upholstered upon both sides and hinged at the front edge, and adapted to be folded out to give place to the back, D, when folded down, substantially as described and specified.

2d, In combination with the frames, C and D, arranged as above, the extension head and foot rests, E E, all made and operating substantially as herein shown and described.

3d, The frame, A, double cushioned seat, C, and folding back, D, and the extension head and foot rests, E, in combination with the covering cushions, F, as herein described, for the purpose specified.

76,571.—HARVESTER.—Cyrenus Wheeler, Jr., Auburn, N. Y.

I claim, 1st, The combination of the endless and continuously moving chain, as the machine advances, the rim, G, and its interior wheel, J, with ratchet, pawl, and spring bolt attachment, for the purpose of setting in motion and driving a rake, at the will of the operator, which rake is automatically thrown out of action at the completion of every sweeping operation substantially as described.

2d, In combination with a rising and falling and sweeping rake, the two pivots or centers of motion, l m, the latter being oblique to and in a different plane from the former, so that, as the rake drops upon the platform, it will cut or shear in under the reel, and fall more nearly to the cutting point, and thus reach all the straw, however short it may be, substantially as described.

3d, In combination with a rising and falling and sweeping rake, the armed lever, q, cam, s, and notches at or near the parts, n p, for the purpose of connecting and disconnecting the two parts, substantially as and for the purpose described.

4th, In combination with the endless chain for driving the reel, the swinging and adjustable arm, 6, with its pulleys, one in each end thereof, for taking up the slack of or letting out the chain, as the reel is lowered or raised on its post, substantially as described.

76,572.—TOP GAME BOARD.—David Wight, New London, Ct.

I claim a board or box constructed with compartments and provided with counters arranged to slide upon wires or rods, substantially as and for the purpose described.

76,573.—HORSE HAY FORK.—J. H. Wilder, Farmington, Ohio.

I claim the bail, D, having slotted end, a, in which the horizontal catch, c, is pivoted centrally, said catch notched at its forward end, and hold engaged with the upper end of the post B, by the rearward projecting spring attached to the rear end of the catch, c, and released by the rope, e, secured to the same end of the catch, and hanging downward through the head, A, all constructed and arranged to operate as herein shown and described.

76,574.—DIES FOR MAKING PLIERS.—Solomon H. Wood, East Berlin, Conn.

I claim the dies represented in figs. 5 and 7, constructed and used in the manner and for the purpose purposes substantially as set forth.

76,575.—SPRING BED BOTTOM.—Abram W. Wright, Bunker Hill, Ind.

I claim the spring, C, made substantially as described, viz., of the two helix coils, the junction loop, and the arms projecting from such coils, the whole being arranged as specified.

Also the pin, k, in the slat, in combination with the spring, C, made and applied to the slat, as specified.

Also the combination of the two supporting screws, e e, and loops, f f, with each spring, C, made and applied to the slat, as specified.

76,576.—CRIMPING MACHINE.—R. A. York, Reading, Mich.

I claim, 1st, The combination of the form, F, spring hinged extension blocks, G G, having grooves, K, hinged extension plates H, adjustable gripes I, adjustable draw block, L, having flanges, N N, and jaw, V, substantially as and for the purpose specified.

2d, The rubbers, A, constructed as described, in combination with the spring, D, substantially as and for the purpose specified.

3d, The rubbers, A, in combination with the slotted arm, 5, roller, 2, and form, T, as herein described, for the purpose specified.

4th, The combination of the rubbers, A, form, F, slotted and grooved V-shaped stock, F, straps, R, rollers, and treadle, substantially as described, for the purpose specified.

5th, The device for crimping leather constructed and combined to operate substantially in the manner and for the purpose described.

76,577.—EXTENSION CHAIR.—B. H. Zinn, New York city.

I claim, 1st, The links, a and b, and catch, d, substantially as shown and described, in combination with the parts, A and B, of an X-chair, all as and for the purpose set forth.

2d, The extension legs, L L K, ratchet legs, J J, and spring lever, h h, substantially as and for the purpose shown and described, in combination with the hinged foot rest, G H, and parts, A B, of an X-chair, all as set forth.

76,578.—CULTIVATOR AND HARROW.—Simon Conrad, Petaluma, Cal.

I claim, 1st, The connecting devices, by which I attach at pleasure the cultivator or the harrow alternately to the truck or carriage, all as shown and described.

2d, In combination with the above, the construction of the spindles on which the wheels of the truck are placed, so that they may be so placed on the axle as to increase or decrease the distance between the wheels, as may be desired, all as and for the purposes shown and described.

REISSUES.

2,910.—APPARATUS FOR SEPARATING SHOT.—Wm. A. Shaw, Gardner Willard, Lewis Colwell, and Joseph Colwell, assignees of Wm. A. Shaw, New York city. Patented Jan. 9, 1866.

We claim, 1st, In the process of manufacturing shot, the use of an automatic apparatus so constructed and operated as to separate the perfect from the imperfect shot, and so as to assort the different sizes of shot and deposit them in separate places or receptacles, substantially as described.

2d, Separating the perfect from the imperfect shot by the use of a series of inclined planes, so arranged and adjusted in respect to each other as to break one or more times the plane and direction of descent, and arrest in whole or in part the motion of the imperfect shot, for the purpose of changing its axis of motion, and thus gradually bring it to rest in receptacles at the foot of the various inclines, leaving the perfect shot only to descend to the bottom of the series of planes.

3d, A series of revolving screens, or assorting the shot, in combination with the inclines and receptacles, substantially as specified.

2,911.—HAY RAKER AND LOADER.—Horace Baker, Cortland, N. Y. Patented July, 3, 1865.

I claim, 1st, The two positively actuated endless aprons, revolving in opposite directions, in combination with the toothed wheels, R2, or their equivalents, upon the shafts, I and L, and so placed relatively that the hay may be picked by such toothed wheels, and directed between the aprons, and by them elevated, substantially as and for the purpose set forth.

2d, The standards, T T, when so constructed that by their elasticity they shall maintain the upper portions of said aprons face to face, and permit variations in the quantity of hay carried between them, as set forth.

3d, In combination with said endless aprons, the guide boards, so constructed as to pass the hay over the forward apron and on to the wagon.

4th, In combination with said endles aprons, the spur wheels, F and H, and the shaft, I, operating in the slot, I 1, and so constructed as to allow of a forward and backward movement of such shaft and forward apron, substantially as and for the purpose set forth.

2,912.—MEDICAL PREPARATION.—Charles L. Lege, San Antonio, Texas. Patented June 11, 1867.

I claim a medicament produced from the material specified.

2,913.—MEAT CHOPPING MACHINE.—Metropolitan Washing Machine Company, Middlefield, Conn., assignees by mesne assignments of Alfred F. Spaulding, and Salmon M. Scott. Patented January 31, 1865.

We claim, 1st, The employment, in an organized machine for chopping meat, vegetables, and other substances, of a revolving tub, and one or more cutters, and actuating mechanism, under an arrangement substantially as described, so that the meat or other substance shall be cut with a "draw cut," or by a drawing stroke of the said cutters.

2d, The arrangement of the frame, and method of hanging the cutter or cutters in said frame, so that when operated, the cutters shall travel toward the bottom of the revolving tub in a curvilinear path, substantially as herein described.

3d, The combination, with the cutter and its vibratory arm and mechanism whereby it is made to operate with a drawing cut, of the means for adjusting the cutter in said arm for the purpose of regulating the stroke of the said cutter, substantially as set forth.

4th, The method herein described, or its substantial equivalent, of mounting the vibratory arms of the cutters upon a padded pin, or so that the cutters may yield to intervening obstructions, as herein set forth.

5th, The combination, with one or more vibratory cutters, and a tub, of a removable cover overhanging the tub, substantially as herein shown and described.

6th, A machine for cutting meat and other substances, composed of the following elements combined: first, a support for the tub, mounted on a central pivot; second, one or more cutters hung in such manner as to produce, when vibrated, a "draw cut;" third, a mechanism to impart vibrating motion to the cutters, and a rotary movement to the tub.

2,914.—MEAT CHOPPING MACHINE.—Metropolitan Washing-Machine Company, Middlefield, Conn., assignees by mesne assignments of Alfred F. Spaulding, and Salmon M. Scott. Patented July 11, 1865.

We claim, 1st, The means for operating the cutter or cutters of a machine for chopping meat, etc., substantially as herein described, so that an up-and-down and back-and-forth movement shall be imparted to the cutter or cutters in the order herein described, thereby effecting an elongated draw cut upon the material to be chopped, as set forth, in combination with a tub rotating during the intervals of stroke, that is to say, when the knive or knives are lifted off the bottom of said tub.

2d, The combination with a rotary tub, of the chopping knives connected directly or through the intermediary of suitable arms, with a revolving crank, so as to operate in the manner and for the purposes herein shown and described.

3d, The combination of cutters with mechanism for vibrating the same in the manner and means herein specified, that is to say, by arms hung upon a revolving crank, and supported by an oscillatory standard.

4th, The combination, with the rotary tub, and one or more chopping knives, and mechanism for moving such knives up and down, and back and forth, in said tub, of a plow, either with or without a guard, adjustable to the frame or other stationary part of the machine in the manner described, so that the same may be held in its proper relation to and within the tub, as set forth.

2,915.—COOKING STOVE.—Philo P. Stewart, Troy, N.Y. Patented April 12, 1859. Dated May 17, 1864.

I claim, 1st, The method or the means, substantially as herein described and set forth, of preventing heat from passing through to the rising flue, leading to the chimney, by separating it from the back oven plate, and from the descending flues, by non-conducting partitions, or the equivalents therefor, and for the purposes herein set forth.

2d, The employment of a double damper, filled with cement or other equivalent non-conducting material, in combination with the flue above the oven, and with the rising flue leading to the chimney, in the manner substantially as and for the purposes herein described and set forth.

3d, The separating of the direct sheet flue, under the oven, from the return sheet flue immediately below the same, by means of the dividing flue plate, i, or any equivalent therefor, constructed, arranged, and combined with the said sheet flues, in the manner and by the means, and for the purposes substantially as herein described and set forth.

4th, The dividing of the space between the bottom plate of the oven and the bottom plate of the stove, by means of the inclined dividing flue plate, i, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

5th, The employment of the space or chambers, S', in combination with the outer edge of the oven bottom plate, and with the back end oven plate, in the manner and for the purposes substantially as herein described and set forth.

6th, The sheet flue division plate, i, having a recess, h', at each front corner thereof, and the projection, A, between such recesses, substantially as and for the purposes herein described and set forth.

7th, The employment of a broad or sheet flue division plate, i, of any equivalent thereof, in combination with the oven and oven bottom flues, in the manner and for the purposes substantially as herein described and set forth.

8th, The additional bottom plate or encasement, r, in combination with the broad sheet flue, h, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

DESIGNS.

2,993, to 2,999 inclusive.—FORK OR SPOON HANDLE.—George Wilkinson (assignor to the Gorham Manufacturing Co.), Providence, R. I.

NOTE.—SIXTY patents in the above list were obtained through the Home Office of the Scientific American Patent Agency.—EDS.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

[ISSUED FOR WEEK ENDING MONDAY, MARCH 2, 1868.]

46,300.—COMBINED RAKE AND REEL FOR HARVESTERS.—Samuel Johnston, Buffalo, N. Y. Dated February 7, 1865. Application for reissue received and filed March 19, 1865.

I claim, 1st, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, I claim so constructing and arranging a cam way as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and then to elevate those which do not discharge above the cut grain on the platform, and above the level pursued by the discharging head or rake.

2d, In combination with a series of revolving arms, carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, I claim a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads, or the teeth thereof, which do not discharge above the cut grain, while passing the platform, and above the level pursued by the heads or the teeth thereof, which so discharge the grain.

3d, In combination with a series of revolving arms, carrying heads or rakes, which all gather the grain, and a part only of which discharge the grain and a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutter and then to rise above the cut grain on the platform, and the level pursued by the discharging head, I claim making said cam or a part thereof movable, so as to permit any one of said rakes or heads to descend, while passing the platform, and become a discharging rake or head.

4th, In combination with the movable cam way or partial cam way set forth in the last claim, I claim a cord or equivalent connection, extending to the driver's seat for operating the said cam way so as to regulate the size of the gavel at the will of the driver.

5th, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads, or the teeth thereof, which do not discharge above the cut grain while passing the platform, and above the level pursued by the heads or the teeth thereof, which do discharge the grain. I claim making the said last mentioned device movable, so as to permit any one or more of said heads, or the teeth thereof, to descend to the level of the platform, and discharge the grain.

6th, In combination with the movable device set forth in the last claim I claim a cord or equivalent connection, extending to the driver's seat for operating the said device so as to regulate the size of the gavel at the will of the driver.

7th, In combination with a series of revolving arms, carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, and a cam way so constructed and arranged as to cause all the heads or beaters to descend to the same gathering level, in front of the cutter, and then to elevate those which do not discharge above the cut grain or the platform, and above the level pursued by the discharging head or rake, I claim an auxiliary cam way opposite to the platform, for guiding and controlling the arm of the rake or head, which discharges the grain.

8th, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part of which discharge the grain, and a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads or the teeth thereof, which do not discharge above the cut grain while passing the platform, and above the level pursued by the heads or the teeth thereof, which so discharge the grain, I claim an auxiliary cam way opposite to the platform, for grinding and controlling the arm of the rake or head which also discharges the grain.

9th, I claim locating the support for a revolving rake and reel, vertically, over the inner end of the finger beam, and attaching it thereto independently of the platform.

10th, The central hub or head, provided with mortises to receive the revolving arm.

11th, A revolving hub or head combined with arms having knee projections and a cam against which they rotate.

12th, The overhanging extension attachment to the heads or beaters, in combination with the outer divider and rim of the platform.

13th, I claim the combination of the elbow of the rake head, with the roller, and the outer and inner tacks or ways, constructed substantially as described, and for the purposes set forth.

64,100.—HORSE HAY FORK.—Samuel and Daniel A. Harris, Shippensburgh, Pa. Dated April 23, 1867. Application for reissue received and filed March 21, 1868.

I claim, 1st, The combination substantially as set forth in a horse hay fork, of a slotted main bar or shank, A, a lifting finger, C, pivoted centrally in the slot of the shank, and a link rod, D, connecting the finger with the forked lever, E, pivoted to the arm, F, projecting from the shank, and having the tripping rope attached to its upper end, whereby the lifting finger is automatically locked in a horizontal position by the weight of the load.

2d, The combination substantially as set forth, in a horse hay fork, of two parallel rigidly connected shanks, with pivoted fingers, for the purposes specified.

3d, The combination substantially as set forth, of the parallel shanks, the pivoted lifting fingers, the link rods crossing the shanks diagonally, and the cross bar, A', whereby the load is compressed before being elevated.

73,807.—LAWN MOWER.—Amariah M. Hills, Hockanum, Ct. Dated January 28, 1868. Application for reissue received and filed March 21, 1868.

I claim, the balanced frame on the roller, E, in combination with the bail, Q, to which the handle, S, is secured, all constructed and arranged, substantially as and for the purpose set forth.

2d, The curved shoes, N, in combination with the side pieces, B B, of the frame, said parts, being connected together to render the frame adjustable, substantially as shown and described.

3d, The horizontal cutter, M, having the spiral blades, c c, in combination with the fixed cutter bar, D, arranged to operate substantially as set forth.

4th, The combination of the frame, roller shoes, cutting device and handle, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

56,345.—EXTENSION CORSET SPRINGS.—Frances L. Barnes, New York city, administratrix of the estate of Samuel H. Barnes (deceased). Dated July 17, 1866. Application for reissue received and filed March 21, 1868.

I claim a corset spring, consisting of the parts, B, provided with pins, b, and slotted springs, B2, riveted as shown, and having suitable clasps, C, and headed rivets, D, and of form corresponding to the body of the wearer, constructed and operating in the manner and for the purpose herein represented and described.

48,244.—CIRCULAR BRICK KILN.—Frederich E. Hoffman, Berlin, Prussia. Dated June 13, 1865. Application for reissue received and filed March 24, 1868.

I claim, 1st, an endless or continuous channel, or gallery of any shape in plan, for gradually heating or burning bricks, or other material, the fuel being ignited by a draft of air, which has become heated by passing through the material previously burned, substantially as herein set forth.

2d, The method, substantially as described, of burning bricks, and other material, by fuel of any kind, as wood, coal, coal dust, etc., which is dropped through openings in the top of the burning channel or gallery.

3d, The arrangement of the flues or dampers, and the movable partition or their equivalents, in combination with the continuous channel or gallery, substantially as and for the purpose set forth.

4th, The smoke chamber, which may be circular, or of any other desired form, in combination with the burning channel or gallery, substantially as and for the purpose described.

15,309.—WATER WHEEL.—John Tyler, West Lebanon, N. H. Dated July 8, 1856. Application for reissue received and filed March 26, 1868.

I claim giving the bucket head, e, of my improved water wheel such a degree of curvature as will enable the water to act upon said head, and upon the buckets descending therefrom, substantially in the manner herein set forth.

I also claim the peculiar shape and arrangement of the series of buckets, d d, of my improved water wheel, viz., the convex surface of each bucket being the shape of the segment of a circle, and the said buckets, being arranged with relation to a grinding inner circle, c, and the periphery of the bucket head, e, substantially in the manner herein set forth.

I also claim connecting the lower edges of the buckets, d d, to each other by means of a scollop-edged rim, i, of such a shape that it will conduct the water from the scroll-shaped water way, directly against the central portion of the convex surface of each bucket, and thence smoothly downward between the buckets, substantially as herein set forth.

20,456.—WATER WHEEL.—John Tyler, West Lebanon, N. Y. Dated June 1, 1858. Application for reissue received and filed March 26, 1868.

I claim the combination of the elevated cover, D, with the curb of a water wheel, substantially in the manner and for the purpose herein described.

I also claim giving the elevated curb cover, D, such proportions, and such a degree of strength, as shall enable the box in its apex to form a firm and reliable upper bearing to the water wheel shaft.

I also claim giving the terminating open mouth, B, of the water way of my improved water wheel, such a shape as shall enable the said water way to be brought into connection with the water-supplying flume, tube, or trunk.

I also claim the combination of a gate, C, with the terminating open mouth B, of the water way of my improved water wheel, substantially in the manner represented in the accompanying drawings.

52,680.—HORSE RAKE TEETH.—Columbus Coleman, Allegheny city, Pa. Dated February 20, 1866. Application for reissue received and filed March 26, 1868.

I claim, 1st, The use of movable forms for giving the desired curve to rake teeth, in the manner substantially as herein described, and for the purpose set forth.

2d, The combination of movable forms, with suitable mechanism for bending rake teeth, the said movable forms, substantially as herein described and for the purpose set forth.

3d, The use of the header, c, movable forms, B and C, and lever, D, when used in connection with the table, A, constructed, arranged, and operating substantially in the manner herein described, and for the purpose set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office, and will not be officially passed upon until the expiration of* 30 *days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* *MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y.*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

225.—MANUFACTURE OF SHOES.—Chas. R. Broadbent, Boston, Mass. Jan 22, 1868.

571.—MOVEMENTS FOR CLOCKS AND WATCHES, AND TO CONVERT SPEED INTO POWER.—Wm. F. Goodwin, East New York, N. Y. Feb. 20, 1868.

618.—SPINNING AND TWISTING MACHINERY.—Joseph Nussey, Paterson, N.J. Feb. 25, 1868.

665.—PEN AND PENCIL HOLDER.—John T. Price, Arrow Rock, Mo. Feb. 27, 1868.

708.—APPARATUS FOR BURNING HYDROCARBONS.—Chas. L. Perkins, New York city. March 2, 1868.

729.—FILE CUTTING MACHINE.—Hugh Kennedy, New Orleans, La. March 3, 1868.

769.—APPARATUS FOR CULTIVATING LAND AND SOWING SEED.—David D Stelle, New Brunswick, N. J. March 5, 1868.

Advertisements.

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*

Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

BUCKWHEAT HULLER—State Rights for sale. Address Joseph Baysore, Freeport, Ill. 1*

PATENTED FELLY BENDERS, of the "Center Bending" Class—and Rights for sale. JOHN C. MORRIS. No. 120 East 2d st., Cincinnati, Ohio.

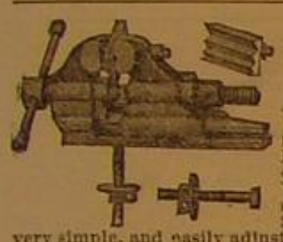
HOW IT WAS DONE.—I will send recipe and instructions for Cold Brazing for one dollar and one postage stamp. WM. A. SWEET, Engineer, Syracuse, N. Y.

WISELLS' SPOKE LATHE.—Turns two and three at a time, of Ax, Pick, Hammer, Plow, and Sledge Handles, and, also, of all kinds of irregular work in wood. Sold in Pennsylvania only by 17 tf BECKWITH, SELLERS & CO., Franklin, Pa.

CANVASSERS wanted for the combined stamp attacher, letter sealer, inkstand, pen rack and wiper, calendar check and envelope case. Expressed, prepaid, for $5. Circulars free. Address 17 4* J. H. MARTIN, Hartford, N. Y.

DIRECT-ACTING STEAM PUMPS,—and Boiler Feeders, in lieu of Injectors. Address, for circulars, the Sole Manufacturers, COPE & CO., No. 118 East 2d st., Cincinnati, Ohio.

TERRITORY FOR SALE. We offer great inducements to persons in our Patent Excelsior self Ventilating Blacksmith Tweer. We offer our Patent Right on the most reasonable terms. For further particulars apply to LAIRD & HEIGLY, Mechanicsburgh, Pa. 17 1*

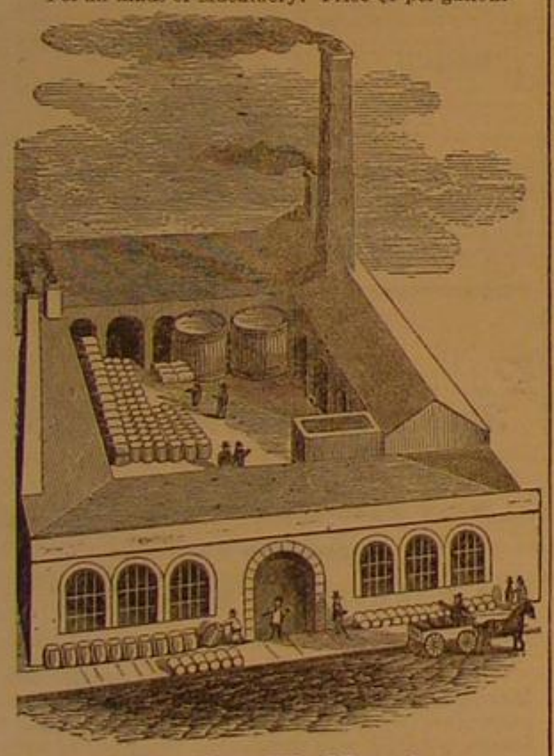


UNION *VISE CO.*, OF BOSTON, MASS., Make VISES of all KINDS, for very heavy or light work. Pipe Vises, with or without extra jaw. Wood-worker's Vises. Vises with covered screws. Send for price list. Standard Milling Machines, very simple, and easily adjusted. 1

E. G. KELLEY'S

1ST PREMIUM PATENT SPERM OIL,

For all kinds of Machinery. Price $1 per gallon.



E. G. Kelley's

REFINED ROCK OR MECCA OIL,

for Railroads, Steamers, and Factories. Price 50 cents. Testimonials furnished, when desired, by persons who have used the oil for years. A liberal discount to the trade. Office 102 and 104 Maiden Lane, New York. 17 1em

MACHINISTS send for Price List of Tools. GOODNOW & WIGHTMAN, 23 Cornhill, Boston. 17 tf

EARL, SMITH & CO.'S

PRE-ANNEALED

Round Machinery,

CAST STEEL.

Finest produced by any living manufacturer. Try it for yourselves. Agency and warehouse, 24 and 26 Fulton st. 1* JAMES SKINNER, Agt., Boston, Mass.

THE WATCH.—A very useful Book for every one about buying or wearing a Watch. Recommended by the Principal Watch Makers, Importers, and Dealers, in New York, etc. THE WATCH—Treating of its construction—How to Choose and How to Use it, etc. By a Watchmaker of over forty years practical experience. Second Edition, Improved and Enlarged. A copy sent by mail, postpaid, on receipt of 60 cents. Address the author, H. F. PIAGET, 119 Fulton st., New York.

BUSINESS OPPORTUNITY.—The Subscriber has a factory, with steam engine and other machinery, all in good running order. Situated about 20 miles from the city, with railway and water navigation, that he offers for sale or he will engage with some party in the manufacture of such articles as they may name, that will afford large profits and sure sale. For further particulars inquire of JOHN SMALLEY, 1* Bound Brook, N. J.

LABORATORY OF INDUSTRIAL CHEMISTRY.—Advices on chemistry applied to arts and manufacturers, metallurgy, agriculture, etc. Informations on chemical fabrications, with plans of factories and apparatus. Analyses of every kind. Address *Prof.* H. DUSSAUCE, chemist, New Lebanon, N. Y. 17 2*

WATER WHEELS—Valentine's Patent Turbine is economical and durable. Built by VALENTINE & CO., Ft. Edward, N. Y. 17 2

THE CRAIG MICROSCOPE

SEND to J. HALL for recent detailed Testimonials of its use in Entomology, Physiology, Pathology, etc.; also wholesale terms. Micros'pe sent for $2 75 by John Hall, Bergen, N.J., or S.R. Wells, 389 Broadway, N.Y.

A PORTABLE ENGINE AND BOILER for sale Cheap, of best Material and Workmanship. Has been in use but three months. Will be sold very low. Call on or address JNO. ASHCROFT, 17 3 50 and 52 John st., New York.

DON'T USE DULL SCISSORS.—Jacobs' Patent Scissors Sharpener—the Staple Sharpener for family use. Samples postpaid 25 cents, or circulars for stamp. GREAT INDUCEMENTS TO AGENTS. SOUTHWIC & HASTINGS, Worcester, Mass.

GREAT ECONOMY IN

WATER POWER.

LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet for 1868 sent free on application. 12 4os* 16 4is*

Cheap, Useful, AND *Elegant.*

IMPROVED BRONZE ALUMINUM HUNTING CASED WATCHES,

(the qualities and resemblance of this new metal are such, compared to Gold, that even judges are deceived), and ROSKOPF'S PATENTED PEOPLE'S WATCH.

The Improved Bronze Aluminum of which my watches are made, is a metal differing entirely from any ever offered to the public. It has seriously occupied the attention of scientific men, and has not only called forth the eulogium of the press, in consequence of its peculiar properties, but has also obtained a Gold Medal at the Paris Exposition and even been favorably noticed by rescript of his holiness, Pius IX., authorizing its use in the manufacturing of church goods.

The qualities of this metal are such that it is surpassed by none, if we except gold itself, and that only on account of the intrinsic value of the latter. Further details will be found in my circular, which will be sent, postpaid, on demand.

My Watches are of three sizes, all hunting cases, one small for Ladies or Lads, and two for Gents. The movements are well finished, and perfectly regulated. I can, therefore, warrant them excellent time-keepers. These goods being manufactured in my own factory, I am enabled to sell any of the above sizes at the extremely low price of $16.

A full assortment of all kinds of Coins always on hand. Goods sent by Express, C. O. D., with charges. Not responsible for money sent inclosed in letters. Address JULES D. HUGUENIN VUILLEMIN, tf] No. 44 Nassau Street, New York.

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip Saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-worsing machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse, 107 Liberty st., New York. 13tf

WOODWORTH PLANERS A SPECIALTY—From new patterns of the most approved style and workmanship. Wood-working Machinery generally. Nos. 24 and 26 Central, corner Union street, Worcester, Mass. 15 tf WITHERBY, RUGG & RICHARDSON.

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents. 12 tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

IRON & WOOD WORKING MACHINERY

TURBINE WATER-WHEELS.

LUCIUS W. POND,

85 LIBERTY ST. N.Y. and Worcester, Mass. 15 tf

For Sale Below Cost.

FIFTEEN PORTABLE STEAM ENGINES, Different Sizes; 8 Portable Flour Mills; 6 Lane's Patent Circular Saw Mills; 1 Muley Saw Mill, Anderson's Patent, and other Machinery. Send for printed description to Washington Iron Works, Newburgh, N. Y., or to WARD & STANTON, 57 Liberty st., New York. Orders for Steam Engines, Boilers, and general machinery solicited. 16 4

SCREW-BOLT CUTTERS.—Schwirtzer's Patent Bolt Cutters, with an equal amount of power and labor, will cut twice as many bolts as any other machine in use. For sale by the SCHWIRTZER PATENT BOLT CO., Green Point, Brooklyn, E. D., N. Y.

Agents Wanted.

FOR THE LIFE OF GEN. U. S. GRANT, By Hon. Henry C. Deming. The only work of the kind issued under the sanction and by the authority of Grant himself. The author is well known as one of the most brilliant writers and eloquent orators in the country. Agents will find this one of the most intensely interesting Biographies ever published in America, and will meet with a ready sale. For particulars, address S. S. SCRANTON & CO., 126 Asylum st., Hartford, Ct. 16 4

PLATINUM. H. M. Raynor, 748 Broadway, N. Y.

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line Improved Lathes for making large valves etc. Address Exeter Machine Works, Exeter, N. H. 13 tf

WROUGHT-IRON BEAMS & GIRDERS

THE UNION IRON MILLS, Pittsburgh, Pa.—The attention of Engineers and Architects is called to our improved Wrought-Iron Beams and Girders (Patented), in which the compound welds between the stem and flanges, which have proved so objectionable in the old mode of manufacturing, are entirely avoided, we are prepared to furnish all sizes at terms as favorable as can be obtained elsewhere. For descriptive lithograph address the UNION IRON MILLS, 5 15* Pittsburgh, Pa.

CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, instruction, Reports, etc., on the useful arts. 1 tf

SPRINGFIELD BRASS FOUNDERY, E Stebbins' Manufact'ng Co., Spring'd, Mass., furnish to order every variety of brass and composition castings, car boxes, letters, Babbitt metal, etc., of superior quality. Sample castings can be seen and orders left at Hayden, Gere & Co.'s, 84 Beekman st., N.Y., and Dalton & Ingersoll's, 17 & 19 Union st., Boston. 8 13*

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies. 12 12*] JOHN ASHCROFT, 50 John st., New York.

BABCOCK & WILCOX'S PATENT STATIONARY STEAM ENGINES, From 25 to 1,000 horse-power, built in the best manner and at the shortest notice by the South Brooklyn Steam Engine & Boiler Works Imlay, Summit, and Van Brunt sts., Brooklyn, N. Y. Over 4,000 horse-power of these engines are now running and contracted for. 108* D. McLEOD, Proprietor.

BEST PLANERS & WOOD TOOLS as formerly, by E. C. TAINTER, Successor to J. A. FAY & CO., Worcester, Mass. 8 tf

BOILER FELTING SAVES TWENTY-five per cent of Fuel. JOHN ASHCROFT, 12 12*] 50 John st., New York.

PORTABLE STEAM ENGINES, COMBining the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's Supplies, of all kinds, at 1 24* M. T. DAVIDSON & CO.'S, 84 John st., N. Y.

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 12 12*

WHEELER & WILSON, 625 BROADway, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1 tf*

POWER PUNCHES AND SHEARS, Straightening Machines, Vertical Drills, etc. Address GREENLEAF & CO. Indianapolis Ind. 7 13* tf

PHOENIX IRON WORKS—Established 1834. GEO. S. LINCOLN & CO., Iron Founders and Manufacturers of Machinists and Gun Tools, 54 to 60 Arch street, Harrford, Conn. Samples may be seen in our Wareroom. 14 tf

YOU CAN SOLDER your own tin ware without a soldering iron by buying one bottle of Wilson's Prepared Solder. Samples sent on receipt of 35 cents, with price list. Agents wanted everywhere. Direct to WILSON & CO., 19 Lindall st., Boston. 11 tf-D

FARMER'S THERMO-ELECTRIC BATTERY, W. H. Remington, Manufacturer and Agent. Manufactory at Cohasset, Mass. Office and salesroom, No. 109 Court street, Boston, Mass. This Battery does away entirely with acids, quicksilver, or liquids of any kind, the electrical current being generated by the action of heat, a simple gas burner being all that is required to put this battery into action. It is clean, constant, and requires no care, performing the work of any acid battery. 14 tf

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes. 12 tf] M. & T. SAULT COMPANY, New Haven, Conn.

PATENT SHINGLE, STAVE, AND Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and Heading Jointers, Heading Rounders and Planers, Equalizing and Cut-off Saws. Send for Illustrated List. 5 tf] FULLER & FORD, and 284 Madison street, Chicago Ill

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail. BENEDICT BROS., Jewelers, 171 Broadway. BENEDICT BROS., up town, 691 Broadway. BENEDICT BROS., Brooklyn, 234 Fulton st. 1 tf

WROUGHT-Iron Pipe for Steam, Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y. 12 12*

A WATCH FOR $1. THE MAGNETIC Time Indicator and Compass, in a neat case, with glass shade, steel and German Silver works, white enamelled dial, ordinary watch size, sound and serviceable. Warranted to denote correct time, and keep in order for two years. Where satisfaction is not given, the money will be returned. Sent, postpaid; for $1; three for $2; or by express, C.O.D., on receipt of $1 as a guarantee. Address HUNTER & CO., Hinsdale, N. H. 16 3

Brick Machine.

LAFLER'S NEW IRON CLAD has more advantages combined in one machine than any other ever invented. It makes common brick of very superior quality. By a slight change, press brick are made without repressing. With Lafler's Patent Mold, beautiful stock brick are made. This machine was awarded first premium at the N. Y. State Fair, 1867, for making Front Bricks. Examining Committee awarded special report, indorsing this machine. For descriptive circular address J. A. LAFLER & CO., 15 tf cow Albion, Orleans county, N. Y.

P.S. PRICE LIST OF STUBS' Files & Tools. Also, U.S. Standard Steel Scales, Squares, etc. Steel letters & Figures. Sent to any address. GOODNOW & WIGHTMAN, 23 Cornhill, Boston, Mass. 13 eow tf

LE COUNT'S PATENT HOLLOW LATHE DOG is Light, Thin, and of at least Double the Strength of others. They have Good Steel Screws, well fitted and Hardened. Prices From ⅜ to 2 inches, 8 sizes, inc.....$ 8 00 do. 2½ to 4 do. 12 " " ..... 17 20 Sent by Express to any address. For circular send to C. W. LE COUNT, South Norwalk, Conn. 13 eow tf

HYDRAULIC Jacks and Punches, Improved. Manufactured by E. LYON, 470 Grand st., New York. Send for a circular. 1 eow13*

TUBE WELLS.—Patented Jan. 21, 1868. The LATEST and BEST.—Warranted to operate where any other will work, and in hundreds of places where others will not. Territory sold by Towns, Counties, or States, for cash or saleable property. Township Rights $25 each, which is the profit on one well of 20 feet. Individual Rights $5 each. Address 11 7 cow* W. T. HORNER, Buffalo, N. Y.

CHASE'S DOLLAR MICROSCOPE AND Bank Note Detector. Agents wanted everywhere. Constant, steady, and profitable employment. Also, two other valuable inventions, just out. Send $1 for sample and circular. Address O. N. CHASE, 81 Washington st., Boston, Mass., or FOWLER & WELLS, 389 Broadway, New York city. 11 4 cow

HOISTING APPARATUS FOR MINES, etc., with our Patent Friction Clutches attached with a variety of sizes of Drums and Gearing, manufactured by VOLNEY W. MASON, 4 mthly] Providence, R. I.

ALCOTT'S CONCENTRIC LATHES.—For Broom, Hoe, and Rake Handles, Chair Rounds, etc., and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, 12 Platt st., New York 1 tf a

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

Morris, Wheeler & Co.,

1608 Market st., Philadelphia, Manufacturers & Dealers in IRON, STEEL, AND NAILS.

Boiler and Plate Iron, Rivets, etc. New York Office, 24 Cliff st. Works at Pottstown, Pa. 17 13

TO BUILDERS, CAR COMPANIES, and others, Jenkins' Patent Self Sash Hanging, for Dwellings, Railroad Cars, etc. State and County Rights for sale. Agents wanted. C. R. JENKINS & CO., 17 4* No. 9½ N. 16th st., Philadelphia, Pa.

Banks, Dinsmore & Co.

Manufacturers of Standard Scales of all Varieties, 9th st., near Coates, Philadelphia. 17 13

SHAW'S "PARAGON"

LATHE TOOL

Is a tough Steel Stock, arranged for interchangeable Cutters, made of Diamond Cast Steel. See illustration in Scientific American of April 4th. Each cutter is shaped and tempered, and merely requires grinding, thus saving all dressing at the forge, and time in waiting. The Thread Cutters are milled to the proper angle, which is maintained until it is used up. Each tool will save its cost in men's time in a few days, and frequently in 24 hours of steady work. After a trial no one will be without them. Size No. 1, is ⅝x1¼, price $3, complete. Extra cutters 25 cents. Manufactured by Patentee, PHILIP S. JUSTICE, No. 42 Cliff st., New York. No. 14 N. 5th st., Philadelphia. 16 4

MERRICK & SONS, Southwark Foundery,

PHILADELPHIA, Pa.,

MANUFACTURE Steam Hammers of Nasmyth and Davy styles.

Apparatus for Making Sugar from Beet Root & Cane Juice, & for Refineries working Sugar & Molasses

Gas Machinery of every description.

Oscillating Engines having SLIDE VALVES worked by ECCENTRIC.

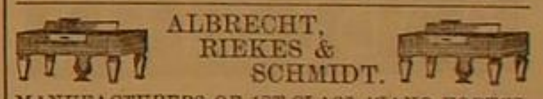
Patterns on hand of sizes—8x10, 10x12, 14x14, 18x12.

N. B.—Designers and constructors of the machinery for the Forest City Sugar Refining Co., Portland, Me. C. Y. Morriss Sugar Refinery, Richmond, Va. Southwark Sugar Refinery, Philadelphia, Pa. Grocers' Sugar House (Molasses), do. 17 eow tf

TAWS AND HARTMAN.—All kinds of Brass Cocks, Gages, Valves, etc. Special fittings for Blast Furnaces and Rolling Mills, Machine Jobbing, and Drafting. Ross & Holland pat. Tallow Cups. 1237 North Front st., Philadelphia, Pa. 15 7eow

ENGINE LATHES—A Specialty.—Send for circular. HARRINGTON & HASKINS, 16 4 Cor. 15th st. and Penn. ave. Philadelphia.

SLIDE LATHES, Iron Planers, Upright Drills, Bolt Cutters, Compound Planers, Universal Chucks, Gear Cutters, etc., at reduced prices. Address 15 13 CHAS. H. SMITH, 135 North 3d st., Philadelphia.



ALBRECHT, RIEKES & SCHMIDT. MANUFACTURERS OF 1ST-CLASS PIANO FORTES No. 610 Arch street, 15 13 Philadelphia, Pa.

Merchandise Tags,

Patent Direction Labels, Shipping Cards, etc. Samples sent on application. DENNISON CO., 15 4 36 South Third st., Philadelphia, Pa.

KENSINGTON IRON WORKS.—Stationary and Portable Engines of any required size made to order. Also, Locomotive, Fine, Cylinder, and Marine Boilers. Tug Boats and Propeller Yachts of any required length, breadth of beam, and Power. 15 8 A. L. ARCHAMBAULT, Philadelphia, Pa.

C. WEST MYERS, STEAM ENGINE Builder and dealer in new and second-hand Steam Engines, Boilers, Lathes, Planers, and other machinery, No. 245 North Front street, Philadelphia, Pa. Reliable references throughout the United States. 14 4

FIRE-PROOF CONSTRUCTION.—Gilbert's Corrugated "Iron Ceiling," for fire-proof buildings. Office No. 429 Walnut street, Philadelphia. Wrought Iron Beams of all sizes. All kinds of Corrugated Iron. Fire-proof Buildings constructed. 14 13 JOS. GILBERT, Superintendent.

Cedar Vats, Tanks, and Reservoirs,

For Brewers, Distillers, Dyers, Chemists, Manufacturers etc., Public and Private Buildings, etc., etc. GEO. J. BURKHARDT & CO., 8 13*] Buttonwood, below Broad st., Philadelphia, Pa.

Bridesburg Manf'g Co.,

Office No. 65 North Front Street, PHILADELPHIA, Pa.,

Manufacture all kinds of Cotton and Woolen Machinery including their new **Self-Acting Mules and Looms,** Of the most approved style. Plans drawn and estimates furnished for factories of any size. Shafting and mill gearing made to order. 7 13* tf

POWER LOOMS. Improved Drop Box

Spooling, Winding, Beaming Dyeing, and Sizing Machines, Self-Acting Wool Scouring Machines, Hydra Extractors. Also, Shafting, Pulleys, and Self-Oiling Adjustable Hangers, manuf'd by THOS WOOD, 2126 Wood st., Phil'a, Pa. 6 13*

FOREMAN AND MOLDER WANTED. Address STEARNS, CLARK & CO., Erie, Pa. 16 3

OIL! OIL!! OIL!!!

FIRST PREMIUM.....PARIS, 1867

Grand Silver Medal and Diploma!

WORLD'S FAIR—London, 1862.

TWO PRIZE MEDALS AWARDED

PEASE'S IMPROVED OILS!

Engine, Signal, Lard, and Premium Petroleum is the Best Made for Railroads, Steamers, and for Machinery and Burning.

F. S. PEASE, Oil Manufacturer, Nos. 61 and 63 Main street, Buffalo, N. Y. N. B.—Reliable orders filled for any part of the world. 6 tf

Advertisements.

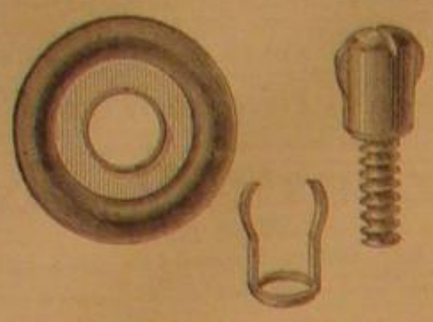
A limited number of advertisements will be admitted on this page at the rate of $1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

CASE & BARCLAY'S

IMPROVED PATENT

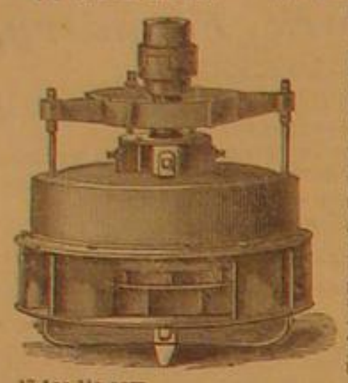
CARRIAGE KNOB AND BUTTONHOLE.

Covered by Three Patents.



THIS Device is Superior to all other Carriage Fasteners now in use, as it allows the curtain to be readily fastened, but prevents it from becoming spontaneously disengaged from the Knob. By compressing the springs on the Knob, the curtain can be unbuttoned. The Knobs are beautifully gotten up, either plain, brass, silverplated, or Japanned. Send for price list and samples to CASE, BARCLAY, & CO.,
17 1os Attleborough, Mass.

WATER WHEELS.



THE DUPLEX TURBINE.—Especially adapted to variable streams, for large or small quantities of water. Gives the same proportion of power to the water used with a partial as with a full gate, something never before accomplished. The smaller wheels kept on hand ready to ship. All wheels guaranteed. Reliable men wanted as Agents.
J. E. STEVENSON, Hydraulic Engineer 88 Liberty st., N. Y.
17 1os 11s eow

WIRE ROPE.

Manufactured by

JOHN A. ROEBLING

Trenton, N. J.

FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 17 5*os

ASBESTOS

THIS Indestructible Mineral differs from all others in possessing fine silk-like fibers which render it capable of being woven into cloth. It is now manufactured (after being crushed or ground) into a fire and water-proof coating for roofs, which can be applied with a brush, and a cement for joints and fissures in stone, wood and metals, and for repairing leaks in roofs, of all kinds, and around chimneys, dormer windows, etc.

We GUARANTEE these materials to be superior to everything heretofore used for such purposes, the fibers of Asbestos giving them strength and tenacity on the principle of hair in mortar.

ASBESTOS ROOFING, 3½ to 7½ cents per square foot.
ASBESTOS ROOF COATING, 75c. and $1 per gallon.
ASBESTOS CEMENT, in 10-lb. pails, 10c. per lb.

For sale by Hardware and Paint Dealers, and at Drug and general Stores. Descriptive circulars will be furnished to all who are interested in the newly-discovered uses of this wonderful mineral.

H. W. JOHNS, Patentee,
And for ten years manufacturer of Improved Roofing Materials, 78 William st., New York.

"We consider this invention one of great value."—Eds. Scientific American. 15 1os*

HOWE'S NEVER FAILING AGUE Cure and TONIC BITTERS. Warranted to cure or no pay. Also, HOWE'S CONCENTRATED SIRUP for blood, liver, skin, CANCERS, etc. Price each $1, or 6 bottles for $5. Address sole proprietor, C. B. HOWE, M.D., Seneca Falls, N.Y.
15 3*os

A PRACTICAL WORKSHOP COMPANION for Tin, Sheet Iron, Copper, and Boiler Plate Workers, Plumbers, etc. Send for a circular.
LEROY J. BLINN,
15 4 44 Woodward Ave., Detroit, Mich.

SPICE CAN AND BLACKING BOX Riveting Machines (Improved), Foot or Power. Send for circulars and sample.
W. PAINTER & CO., Patentees,
15 13 45 Holliday, st, Baltimore.

ANDERSON'S PATENT MULEY SAW Hangings. The oscillating lower Muley and self-adjusting rake upper Muley performs ¼ more work with ¼ less power than any other. COE & WILKES, Painesville, Ohio, sole manufacturers, except for the States of Maine and Pennsylvania. Send for circulars. 15 8

A GOOD THING.—HOW TO GET IT. Would you know what you can do best? What calling or pursuit to follow in life? And how to make the most of yourself? Read the PHRENOLOGICAL JOURNAL. It has a very large circulation, is now in its 47th Vol., and only $3 a year. Or the JOURNAL and SCIENTIFIC AMERICAN for $5. Address S. R. WELLS, or MUNN & CO., New York. 15 4

LATHE CHUCKS—HORTON'S PATENT—from 4 to 36 inches. Also for car wheels. Address, E. HORTON & SON, Windsor Locks, Conn. 4 13*

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.

N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. 15 12*

A NEW CLASS IN PRACTICAL PHRENOLOGY is forming. For circular, with full particulars, address, with stamp "Phrenological Journal, New York. 14 4

SULPHUR MANUFACTURERS.—The Patent of Dr. Sincay, for the Manufacture of Sulphur, patented Oct. 30, 1866, is offered for sale. It is a very valuable invention, and is in extensive use abroad. For further particulars address
ST. PAUL DE SINCAY,
La Vieille Montague, Belgium, care Scientific American office, New York. 15 8

BODINE'S JONVAL TURBINE WATER Wheel, combining great economy in the use of water, simplicity, durability, and general adaptation to all positions in which water can be used as a motive power. We are prepared to furnish & warrant the same to give more power than any overshot or other turbine wheel made using the same amount of water. Agents wanted.

Send for descriptive circular.
BODINE & CO., Manuf's, Mount Morris, N. York, and Westfield, Mass.
17 os tf eow

Pressure Blowers

OF ALL SIZES, for purposes where a blast is required. For particulars and circulars, address B. F. STURTEVANT, No. 72 Sudbury st., Boston, Mass.
17 ostf

J. F. WERNER, Model Maker & Machinist, 62 Center st., N.Y. Particular assistance given to inventors in developing their designs. Tools made to order.
17 1*os

TO CARPENTERS, Manufacturers, etc., this Patent Saw Set is a most valuable tool. It sets all kinds of saws with great ease, perfectly true on both sides as you go over it. Circular saws need not be taken out of the mandrel. All sets made of steel and warranted. Liberal discount to Agents. For terms, etc., address NORTON, LIBBY, & Co., Manuf's and Proprietors, 339 Mill st., Poughkeepsie, N.Y.
17 1os

ADJUSTABLE DRILL CHUCK—holds from ⅛ to ⅜ in. $3. Improved Lathe Dog, carries from ⅜ to 2-in. diam. Light and strong—will take the the place of full set of ordinary dogs. Price $1. Address AMERICAN TWIST DRILL CO., Woonsocket, R. I.
17 ostf eow

WANTED—A New or 2d-hand dredge Machine for Hydraulic purposes. Address, with particulars, H. WEAKLEY,
Secretary Dayton View Hydraulic Co., Dayton, Ohio.
17 1os*

Band Saws and Files.

FRENCH BAND SAW MACHINES and SAWS—For Sawing Logs and Resilitting. Also, for Light and Heavy work. G. GUEUTAL,
1*os 39 West Fourth st., New York.

EMERSON'S PATENT MOVABLE-TOOTHED CIRCULAR SAWS SUPERIOR TO ALL OTHERS. FOR DESCRIPTIVE PAMPHLET ADDRESS AMERICAN SAW Co. N.Y.

EMERSON'S PATENT PERFORATED CIRCULAR & LONG SAWS REQUIRE NO GUMMING. FOR DESCRIPTIVE PAMPHLET ADDRESS AMERICAN SAW Co. N.Y.

Factory, Trenton, N. J. Office, No. 2, Jacob st., N. Y. 14 tf

FREE. Our New Catalogue of Improved STENCIL DIES. More than $200 A MONTH is being made with them S. M. SPENCER & CO., Brattleboro, Vt. 6ostf

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven. 5os tf

Ready Roofing

READY ROOFING.—The first customer in each place can buy 1000 feet of Roofing at half price—$25. Samples and circulars sent by mail. Ready Roofing Co., 81 Maiden Lane, New York. 12 tf os

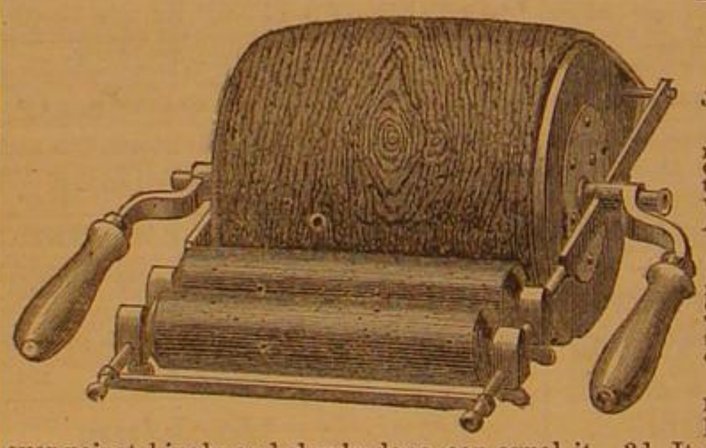
Reynolds'

TURBINE WATER WHEELS

And all kinds of MILL MACHINERY.
Send for Illustrated Pamphlet.
GEORGE TALLCOT,
96 Liberty st., New York.
14 13* os

WHEATON'S OINTMENT cures the Itch
WHEATON'S OINTMENT will cure Salt Rheum.
WHEATON'S OINTMENT cures Old Sores.
WHEATON'S OINTMENT cures all diseases of the Skin.
Price 50 cents;—by mail 60 cents. All Druggists sell it.
WEEKS & POTTER, Boston, Proprietors. 2 tf os

Our Pail Machine, with Two Boys, can Grain Two Thousand Pails per Day.



1ST PREMIUM MEDAL AWARDED.
WM. H. MURPHY, THEO. L. DE VINNE, } Judges.
JNO. W. CHAMBERS, Sec. Am. Institute.

The attention of Painters, Manufacturers of Woodenware, Cottage Furniture, Coffins, Refrigerators Sleighs, Agricultural Implements, Chairs, etc., etc., is invited to

AIR CYLINDER GRAINING MACHINE.

This machine Grains in Oil Colors, perfect imitations of Walnut, Rosewood, Chestnut, and Oak, in all their varieties. The impressions are as sharp and true as those of the photograph. The advantages of this machine are:—

1st. It performs many times as much labor as can be done by hand. 2d. No hand work, however painstakingly and slowly done, can equal it. 3d. It does not require a highly skilled workman. 4th. It is adapted to all kinds of work, and can be applied to any surface, flat or curved. 5th. The machine is substantially made of vulcanized rubber, with brass side-plates, so simple and durable that it will last for years without getting out of order. 6th. *By an improvement made last year, the figure can be carried close to the ends of the panel.* 7th. *The pattern plates are now reinforced by a patent backing, which prevents their breaking.*

☞ This machine has taken the First Premium at the American Institute Fair, this year. See Report of Committee. Also, see Scientific American, August 3, 1867. Samples of the work done on exhibition at the office. For circulars and further particulars address,

9 6os eow HEATH, SMITH & CO., 44 Murray street, New York.

$10 TO $20 A DAY GUARANTEED.

GOOD Agents wanted to introduce our new **Star Shuttle Sewing Machine**—Stitch alike on both sides. The only first-class, low-priced machine in the market. We will consign Machines to responsible parties, and employ Energetic Agents on a Salary. Full particulars and sample work furnished on application. Address W. G. WILSON & CO., Cleveland, Ohio, Boston, Mass., or St. Louis, Mo. 13 6os

SCALE IN STEAM BOILERS.—An unobjectionable article for the removal and prevention of incrustations is now offered to the public by M. A. GLYNN & CO.,
14 4os* Of No. 80 Cedar st., New York.

ASHCROFT'S LOW WATER DETECTOR will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York. 12 12*

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21*

MODELS, PATTERNS, EXPERIMENTAL, and other Machinery. Models for the Patent Office, built to order by HOLSKE MACHINE CO., Nos. 526, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN office. 14 tf

J. R. ROBINSON, Consulting and Superintending STEAM ENGINEER,
28 State st., Boston, Mass.
☞ Particular attention given to Inspecting and Testing Steam Machinery, as to safety of Boilers, power of Engines, and as to the useful effect of fuel consumed.
14 5*

EMPLOYMENT.—$15 to $30 a day guaranteed. Male or Female Agents wanted in every town—descriptive circulars free. Address
15 13—N.] JAMES C. RAND & CO., Biddeford, Me.

FOR STEAM ENGINES, BOILERS, SAW Mills, Cotton Gins, address the ALBERTSON AND DOUGLASS MACHINE CO., New London, Conn. 15 11

HYDRAULIC PRESSES FOR SALE.—1 set Vertical Hydraulic Presses, 5 bags each, with pumps, heater, and driving shaft complete, for Linseed, Cotton, Mustard, or Castor Oil. 1 Bookbinder's Press, 10-in. cylinder, plata. 44x29. 1 Bookbinder's Press, 9-in. cylinder, plata. 40x26. Also, Engines and Boilers from 5 to 100 horse-power, on hand. Also, conical logwood chippers. WILLIAM ARTHUR,
President Atlantic Steam Engine Works, cor. Water and Pearl sts., Brooklyn. 15 2os*eow

STEAM ENGINES

FROM 4 TO 200 HORSE-POWER—Including LOOMIS' PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONARY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, GRAIN MILLS, etc.
Send for Descriptive Circular and Price List.
WOOD & MANN STEAM ENGINE CO., UTICA, N. Y.
Warerooms, 89 Liberty st., near Broadway, N. Y.
10 ostf and 201 and 203 South Water st., Chicago, Ill.

LIVINGSTON & CO., Iron Founders, Pittsburgh, Pa.
Fine Light CASTINGS All Kinds, Either Grey or Malleable Iron. 16 2

THE GRAND COMBINATION.—The United States Hay and Cotton Press. Its success fully established and all Presses now before the public pronounced the best in the world. Responsible manufacturing firms and capitalists can now make liberal arrangements with the proprietor for introducing them in all sections of the country. The merits and cheapness of the Press enables them to be sold rapidly and more readily than any others. For circulars and particulars address JAS. H. BIGGS,
Dyer, Lake Co., Ind., or Box 2239, Cincinnati, Ohio.

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.
16 4

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

THE

HARRISON BOILER

HAS ABSOLUTE SAFETY!
HAS GREAT ECONOMY IN FUEL

HAS DURABILITY AND FACILITY OF REPAIR.

Hundreds of these boilers have now been in use for years, giving perfect satisfaction. For descriptive circular and price apply to

JOHN A. COLEMAN, Agent,
83 Kilby street, Boston, Mass.

J. B. HYDE, Agent,
Office No. 9, at 119 Broadway, New York, or to

THE HARRISON BOILER WORKS,
9 13*] Gray's Ferry Road, Philadelphia, Pa.

WOOD-WORKING MACHINES of all kinds on hand. Also, one Gray & Wood planer, one "Wicks" patent resliting mill, one car mortiser, one tenoning machine, and one flouring machine, at a bargain. Address CHAS. H. SMITH, 135 North 3d st., Philadelphia.
15 3os

Soda Fountains

For sale at No. 302 North 12th st., Philadelphia, Pa., by
14 4os J. C. JOHNSON.

Industrial Works.

MACHINISTS' TOOLS AND EQUIPments for Railroad, Iron Ship Building, and Gun Shops.

STEAM HAMMERS,

TURN TABLES, Shafting, Bolt Cutters, Cotter and Key-Seating Machines, Cranes, Cupolas, etc.
9 13os*] BEMENT & DOUGHERTY, Philadelphia, Pa

DRAWING INSTRUMENTS.—A Manual of 112 pages describing all Mathematical Instruments and Drawing Materials, their use, and how to keep in order. Sent free on application by JAS. W. QUEEN & CO., Mathem'l Inst't makers, 924 Chestnut st., Philadelphia.
11 10*os

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY.
Works, Paterson, N. J.; Warerooms, 4 Dey st., N. Y., Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Rope & Oakum Machinery; Snow's & Judson's Governors; Wright's Patent Variable Cut-off & other Engines. 9 tf

NICHOLSON FILE COMPANY,
Providence, R. I., Sole Manufacturer of the

Patent Increment File.

Circulars, giving prices and explaining peculiarities of manufacture, sent on application. The best testimonials as to the merits of this File can be furnished. 5 13*

D. BALLAUF, MODEL MAKER, No. 414 Seventh street, Washington, D. C.
Orders for Certified Duplicates of Patent Office Models and Original Models for Inventors. 5 13*

FRENCH BURR MILLSTONES, BOLTING CLOTHS,
Of the very best qualities imported,
Supplied Cheaper than any other house in the country by
GEO. TALLCOT,
14 13* 96 Liberty street, New York.

FUEL Economized and Power Increased by Carvalho's Pat. Steam Super-Heater, easily attached to boilers, gives perfectly DRY steam, remedies "priming." Address H. W. BULKLEY, Gen'l Ag't, 70 Broadway, N.Y.
9 13*

1868.

Scientific American.

THE

BEST PAPER IN THE WORLD.

Published for Nearly

A QUARTER OF A CENTURY.

This **Splendid Newspaper**, greatly enlarged and improved, is one of the most reliable, useful, and interesting journals ever published. Every number is **beautifully printed and elegantly illustrated** with several **Original Engravings**, representing New Inventions, Novelties in Mechanics, Agriculture, Chemistry, Photography, Manufactures, Engineering, Science and Art.

Farmers, Mechanics, Inventors, Engineers, Chemists, Manufacturers, people in every profession of life, will find the **SCIENTIFIC AMERICAN** to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the value of which is beyond pecuniary estimate. All patents granted, with the claims, published weekly.

Every Public or Private library should have the work bound and preserved for reference.

The yearly numbers of the **SCIENTIFIC AMERICAN** make a splendid volume of nearly one thousand quarto pages, equivalent to nearly **four thousand ordinary book pages.** A New Volume commences January 1, **1868.** Published Weekly. **Terms:** One Year, **$3**; Half-Year, **$1 50**; Clubs of Ten Copies for One Year, **$25**; Specimen Copies sent gratis.

Address

MUNN & CO.,

37 Park Row, New York.

☞ The Publishers of the **Scientific American**, in connection with the publication of the paper, have acted as **Solicitors of Patents** for **twenty-two years. Thirty Thousand** Applications for Patents have been made through their Agency. More than **One Hundred Thousand Inventors** have sought the counsel of the Proprietors of the **SCIENTIFIC AMERICAN** concerning their inventions. Consultations and advice to inventors, by mail, free. Pamphlets concerning Patent Laws of all Countries, free.

☞ **A Handsome Bound Volume**, containing **150** Mechanical Engravings, and the United States Census by Counties, with Hints and Receipts for Mechanics, mailed on receipt of **25c.**

SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XVIII.--No. 18. [NEW SERIES.]

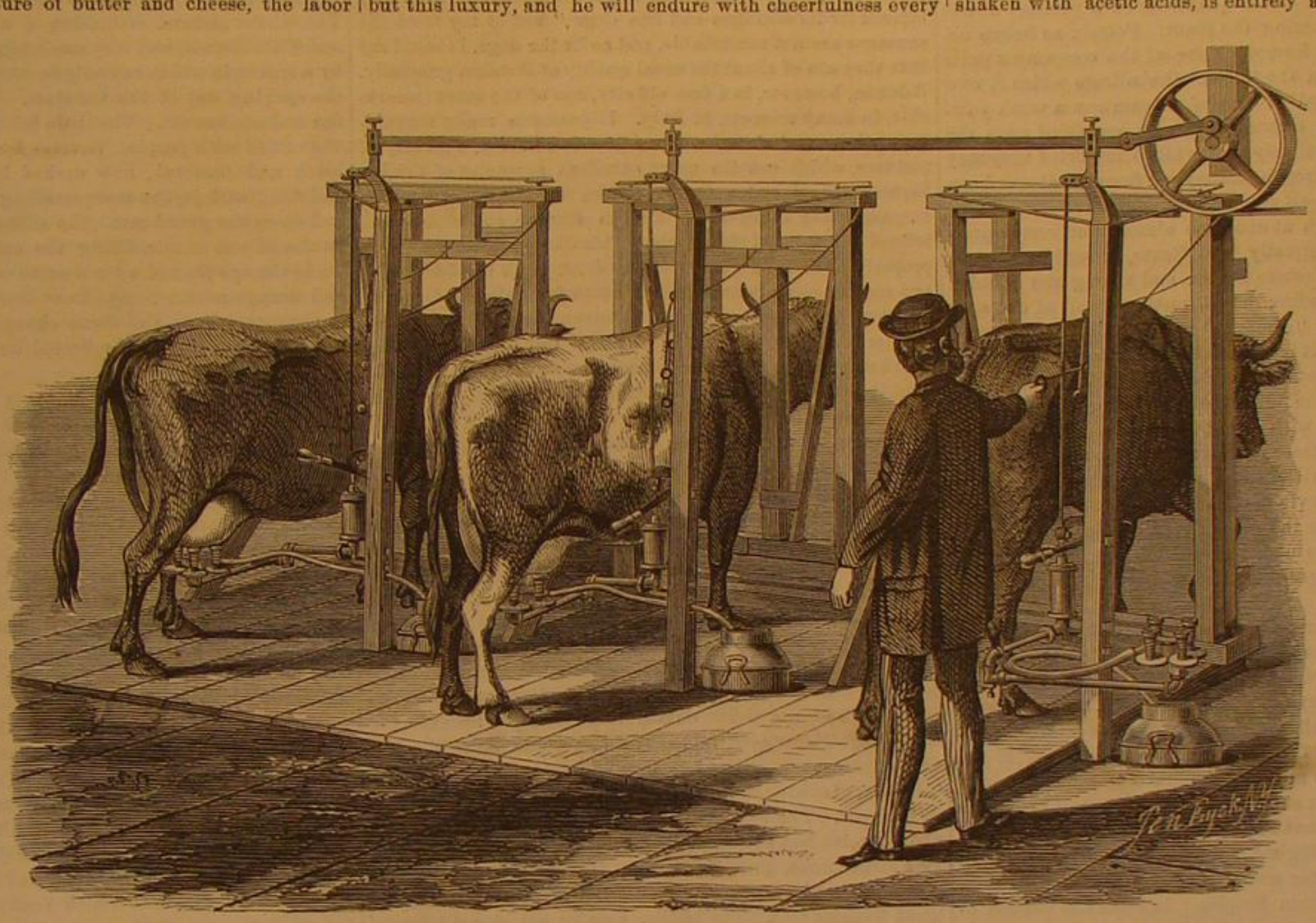
NEW YORK, MAY 2, 1868.

$3 per Annum. [IN ADVANCE.]

Hydraulic Cow Milking Machine.

Every dairyman knows the trouble and labor of milking a dairy of cows by hand, and the difficulty of procuring good milkers, who will always milk the cows alike, clean, quickly, and thoroughly, with comfort to the animal. They have experienced the aching of hands and been troubled with kicking cows. There is no labor done on the farm more uninviting and monotonous; yet it cannot be delayed or put off to a "more convenient season." While machinery has been adapted to the manufacture of butter and cheese, the labor of milking has heretofore been left to muscular exertion alone; the Hydraulic Cow Milker, however, which is illustrated in the engraving is intended to relieve the farmer from the irksome work of hand milking.

The accompanying engraving is an illustration of three machines operated with power and attended by one man; two machines, each milking a cow, and one turned back out of the way, for the cow that has been milked to pass out to make way for another to come into the stall to be milked, not stopping the power while changing the cows. The stanchion is the same as any ordinary stanchion, with the exception that it opens out to let the cow pass through to facilitate the changing of cows. In this manner cows can be very quickly brought to the machine,—occupying less time than it would to go to the cow in the yard or stable.



COLVIN'S PATENT HYDRAULIC COW MILKER.

The cows soon learn to come to the machine if fed or salted a few times while being milked. The milk runs into large cans partially sunk in the floor. Three machines are sufficient to milk sixty cows in the time it would take six men to milk them by hand, and one man can attend to all the machines, which may be run by hand, dog, or other power.

The milkers are worked by pumps, the pistons of which are driven by power. They are attached by a jointed iron pipe to allow of the movement of the cow forward, backward, or sideways, always adapting itself to her motions. The teat cups are of corrugated rubber closely enveloping the teats, and will fit those of any cow. The pumps oscillate, giving the natural motion of the calf in sucking or of the hand in milking; the space between the elastic diaphragm in the milker and the pump being, filled with water, which in working the pumps, oscillates in the tube and produces a vacuum at each alternate stroke of the piston. No dust, hairs, or dirt can possibly find their way into the milk while passing to the receiving cans. The machine has been exhibited in this city and attracted considerable attention. Having witnessed its practical operation, we are willing to add our testimonial to that of others in regard to the facility of working and the apparent value of the machine. Its operation appears to be as agreeable to the cow as it is effective in saving time and labor.

Patented May 22, 1866, and Feb. 18, 1868; patents for minor improvements now pending through the Scientific American Patent Agency. All orders or communications for information should be addressed to the Hydraulic Cow Milker Manufacturing Co., No. 1 Vesey st., Astor House block, New York city.

THE CHEMISTRY OF TOBACCO.

Since the days of Sir Walter Raleigh this plant has had its partisans and its strong opponents, but we have never learned that any arguments on the subject have ever effected the conversion of a single individual from the prejudices which he may have entertained for or against it. A quotation from the pen of an eminent medical historian on this subject may not be devoid of interest. "This most extraordinary plant, notwithstanding its powers of fascination, has suffered many romantic vicissitudes in its fame and character; it has been successively opposed and commended by physicians—condemned and eulogized by priests and kings—and proscribed and protected by governments—while at length this once insignificant production of a little island, or an obscure district, has succeeded in diffusing itself through every climate, and in subjugating the inhabitants of every country to its dominion. The Arab cultivates it in the burning desert—the Laplander and Esquimaux risk their lives to procure a refreshment so delicious in their wintry solitude—the seaman, grant him but this luxury, and he will endure with cheerfulness every other privation, and defy the fury of the raging elements—and in the walks of civilized society, at the shrine of fashion, in the palace and in the cottage, the fascinating influence of this singular plant commands an equal tribute of devotion and attachment."

Of the plant known by the generic name of *Nicatiana*, there are three principal species, which are essentially the same in their general characteristics, but somewhat different in a few of their minor ones, and these are all called by the common English name of *tobacco;* by the French, *tabac;* by the Germans, *tabak;* and by the Spanish *tobaco*. It was called Nicotiana in honor of John Nicot, an embassador of France at the Court of Lisbon, who introduced it into the former country in the year 1560, one year after it had been sent into Spain and Portugal by Hernandez de Toledo, at which time, as far as historical record can be relied on, it was first introduced into the continent of Europe. Twenty-five years afterward, in 1585, it was brought by Sir Francis Drake from Tobago, one of the windward group of the West India Islands, whence originated the common name of tobacco. Other historians, however, derive the name from Tabasco, one of the provinces of Yucatan, where it is said to have been found by the Spaniards. In 1589 it was carried from Spain into Italy, by the Cardinal Santa Croce, and from these countries soon after found its way throughout the entire continent. A superior quality of tobacco is a native of China, and is thought to have been cultivated in Asia long before the discovery of America by Columbus. The best Cuba tobacco is obtained from the same species.

Tobacco leaves contain, besides the peculiar principles which we will presently examine, nearly 3 per cent of a bitter extractive matter, about 5 per cent of lignin, nearly 88 per cent of water, with variable smaller quantities of silica, gluten, albumen, resin, starch, and several salts of lime, potash, and ammonia, in the form of phosphates, sulphates, nitrates, chlorides, and malates, though in this plant the malic acid goes by the name of nicotic acid. The characteristic alkaloid obtained from tobacco is called *Nicotin*, $C^{20}H^{14}N^2$—162. It is prepared by distilling 500 parts of smoking tobacco with 6,000 parts of water, and 200 parts of caustic soda, and receiving the distillate in a flask containing about 40 parts of sulphuric acid in three times its weight of water, continuing the process till about 3,000 parts have come over. This is evaporated to about 100 parts, maintaining a slight excess of acid throughout the process. It is again distilled with an excess of caustic soda, and concentrated *in vacuo*, during which it gives off ammonia and assumes the consistence of a yellowish sirup, from which, in a few days, are formed minute crystals or plates of nicotin, but which are hygroscopic to such a degree as to prevent their being kept in that form. It is soluble in all proportions in water, and still more so in alcohol and ether. It is solubie in 40 parts of oil of turpentine, and in oil of almonds, which, by being shaken with acetic acids, is entirely absorbed by the latter. Olive oil also dissolves it. With the acids it forms salts, which are generally soluble in water and alcohol, but insoluble in ether. It unites with gallo-tannic acid, forming a salt which is but slightly soluble, and has therefore been suggested as an antidote against the effects of the alkaloid in the system.

In its action upon the animal economy, it is one of the most powerful poisons that is known in the vegetable kingdom, a few drops of its concentrated solution being sufficient to cause a destruction of life in man in from two to five minutes. The oil of tobacco, obtained by the distillation of the cured leaves at a temperature above that of boiling water, contains a large proportion of nicotin, and is therefore poisonous. Tobacco pipes or cigar tubes, when long used without cleaning, contain a considerable portion of this oil, and give the peculiar smell and acrid taste which are so disagreeable to the uninitiated. The finest qualities of Havana tobacco contain 2 per cent of nicotin, the Virginia and Connecticut about 6 per cent, and that which is raised on the soil of France a high as 9 per cent.

Another principle found in tobacco is called *Nicotianin*, $C^{15}H^{12}N^2O^6$, and is the true aromatic essence of the plant, or tobacco camphor. It is obtained by distilling the fresh leaves, with their weight of water, and repeating the process two or three times. It is a fatty substance, having the odor of tobacco smoke, and an aromatic, bitterish taste. It is sparingly soluble in water, soluble in alcohol and ether, and in liquor of potash, but unaffected by the dilute acids. It is soluble, with decomposition in hot nitric acid. To the presence of this substance, and the comparative absence of the alkaloid nicotin, is due the value of tobacco for smoking purposes.

When chewed, tobacco has sometimes been know to produce symptoms of delirium tremens and paralysis, but these cases are rare; it is sometimes recommended in rheumatism of the jaws, and in toothache.

During the process of curing and preparation for use, tobacco leaves undoubtedly undergo a great chemical change, generating, as the process does, a much greater proportion of nicotin and nicotianin.

The best qualities of the prepared leaf have a rich velvety brown appearance, and comparatively small leaf veins, while these in the inferior qualities have a coarse, woody appearance, and when burnt emit a disagreeable empyreuma like that of burning wood or straw. Of its various uses in medical practice we need say nothing in this connection. Its consumption for the several purposes of chewing, smoking, and snuffing, in almost every civilized country, is sufficient to almost exceed the belief of the most credulous, and the revenue to their respective governments, from its importation, manufacture, and sale, is second to that of very few other productions.

Sulphureted hydrogen and hydrocyanic acid have been detected in very minute quantities in the smoke of tobacco, but do not exist already formed in the plant. The former is doubtless derived from the sulphate of potash and the hydrogen of some of its elements, and the latter from the carbon and ammonia.

Among the various adulterations to which chewing tobacco is subject, are lead, copper, antimony, copperas, black hellebore, alum, sugar or molasses, dock leaves, and corrosive sublimate. These are added to give flavor or pungency to the weaker and poorer varieties, and the legitimate effects of such villainous compounds need not be mentioned. Too much of the "fine cut chewing tobacco" is wrapped in an inferior kind of tin foil, having a great proportion of lead in its composition, and partial paralysis of the tongue and muscles of the mouth has followed its use, from the lead salts thus formed, when the simple use of the tobacco in its pure state would have failed to produce results so deleterious.

For chewing purposes, an article called British herb tobacco has been substituted for the genuine "weed," and is composed of thyme, marjoram, and hyssop, of each two ounces; coltsfoot, three ounces; betony and eyebright, of each, four ounces; rosemary and lavender, of each, eight ounces; the whole mixed, pressed together and cut in the form of plug tobacco. It is harmless, cheap, and among the poorer classes answers a good purpose. For smoking purposes, the bark of the cascarilla is sometimes added to impart a peculiar flavor, and the leaves of various other plants are sometimes substituted in part for those of the tobacco. Niter is sometimes added to make it burn more rapidly, though it is frequently found in small quantities as a product of the chemical process of curing the plant. Potash, as before observed, exists already formed as one of the component parts of tobacco, aside from the trace of the nitrate which it contains, and in the usual process of preparation a weak solution of potash, or its carbonate, is also sprinkled upon the leaves, and it is not unlikely that while being dried they may absorb a portion of nitrogen and oxygen from the atmosphere, sufficient to form a small amount of the nitrate.

Snuff-taking, though at one time almost a universal practice, has now fallen greatly into disuse, though in some of the Southern and Western States, and among the Spanish dames of the West Indies, the disgusting habit of chewing snuff, or as it is called "dipping," is still followed to a great extent. Medicinally, it is recommended for colds, catarrh in the head, and several other purposes. Snuff is usually adulterated with salt, for the purpose of increasing its weight and keeping it moist, and with urine, muriate of ammonia, and powdered glass, to increase its acrimony and pungency. Some kinds are moistened with cane juice or molasses and water, which gives rise to the vinous fermentation, and rum is sometimes added to produce the same flavor. Quicklime or caustic alkali is sometimes added to the tobacco to develop the flavor as well as to neutralize the acid formed in fermentation.

Many other substances are also added, either to color or flavor, thus forming the different varieties of Scotch, Welsh, Spanish, Lundyfoot, French, Russian, Strasburgh, Maccoboy, and many others. They are sometimes medicated with subsulphate of mercury, nitrate of silver, etc., for catarrh, headache, inflammation of the eyes, and other diseases of the nerves of the head, the mucous membrane of the nose, etc.

The use of tobacco for snuffing and smoking had arrived to such a pitch in 1624 that Pope Urban excommunicated all who were detected taking snuff in the church, and in 1634, the penalty of having the nose cut off was executed against all smokers in the Russian Empire. In 1653, the council of the Canton of Appenzell, Switzerland, ordered all innkeepers to inform against such as were found smoking in their houses, and when so detected, the culprits were severely punished. As late as in 1719, the Senate of Strasburgh prohibited the cultivation of tobacco from an apprehension that it would diminish the growth of corn. In other places its use in any form has been made a capital offence, as it was thought to be adverse to fecundity.

To most of the lesser animals, insects, worms, etc., this plant acts as a virulent poison, and for this reason its decoction is often used to destroy parasites on animals and plants. —*Journal of Applied Chemistry.*

EDITORIAL CORRESPONDENCE.

Rome to Venice—Pistoja and across the Appenines to Bologna —The Portico and Chapel of St. Luke—Splendid Campo-Santo. How the Dead are Buried—Approach to Venice—The Carnival—The Church and Piazza of St. Mark—Other Sights of the City.

Nothern Italy, Feb. 1868.

The country between Rome and Leghorn is a wearying monotony, but from Leghorn to Lucca and to Pistoja, situated at the base of the Appenines, it is charming and extremely picturesque. The soil is very rich, the hills are covered with vines, olives and chestnuts, and I was informed that nowhere in Italy could be found a more laborious and intelligent people. A good degree of improvement seems to have existed for a long time in this section, which never would tolerate any Jesuits.

Pistoja is an old walled town, situated at the foot of one of the spurs of the Appenines, and enjoys the enviable reputation of being the first place where pistols were made, which bear the patronymic or family name. Having a couple of hours leisure on hand before the departure of the connecting train for Bologna, we improved the time by a carriage drive through the town. There are, as usual in such places, some fine old churches and palaces; but the most noticeable feature as the dull and sleepy appearance which seemed to hang over every visible object. The rumble of our carriage wheels over the smooth pavement fairly set the people to rubbing their eyes. They poked their heads out of the shop doors, and even stopped in the streets—the few that chanced to be wandering there—as if surprised to see and hear so much real life and noise. I have never yet been able to discover how several thousand people manage to keep soul and body together in some of these wofully stupid European cities.

A little, shriveled-up *laquais de place* begged of us to permit him to show us the Cathedral, on the plea that "a fellow must live somehow," but how? that was the mystery that puzzled us. He seemed to be happy when we gave him a half-franc without asking him to show us the Cathedral, which stood before us visible to the unassisted eye.

About two miles beyond Pistoja, the railway begins to ascend the mountains, through tunnels and over bridges, the whole forming the most stupendous piece of engineering that I have yet seen. The grades are very sharp, and at some places in the long, winding tunnels it was with the utmost difficulty that the locomotive could crawl along. The train occupied two hours in getting to La Porreta, a distance of about nineteen miles. Here we encountered the snow and chill of winter, which continued to Bologna, the streets of which were piled up with embankments of snow nearly five feet high. It was a strong contrast to what we had witnessed only two hours before, upon the plains, where we saw the trees budding, the vegetables green in the gardens, and the farmers busy with their plows, preparing the soil for the seed. Some antiquated writer has described Bologna "as chiefly famous for its sausages and fine dogs;" but to my taste the sausages are not remarkable, and as for the dogs, I should say that they are of about the usual quality of Pupdom generally. Bologna, however, is a fine old city, one of the most remarkable, in many respects, in Italy. It possesses really magnificent palaces and churches, some fine monuments, a gallery of pictures, which contain many excellent examples of the Bolognese school, and a Campo Santo, or burial place, which surpasses any thing of the kind in Europe, and attests the refined character of the people. This Campo Santo may very properly be called a gallery of the dead, as all the fine tombs and monuments are arranged in extensive galleries for form a sort of holy museum of art. Between the galleries are several large open courts for the burial of the humbler classes, who have not the means necessary to provide for a more elegant interment. A portion of the building, together with the church, were once an extensive monastery, to which additions have from time to time been made, as one after another have been borne to the palatial mausoleum.

In connection with the Campo Santo, there is a large vaulted chamber designed to receive the marble busts of eminent citizens. I was curious to see the head of Mezzofanti, who was once a professor of Greek and oriental literature in the celebrated University of Bologna. At the time of his death, in 1849, he could converse in forty-two different languages. Byron says, "I tried him in all the languages of which I knew only an oath, or abjuration of the gods against pirates, savages, boatmen, muleteers, camel-drivers, etc., and, by Heaven! he puzzled me on my own idiom." Speaking of Campo Santos reminds me to say a few words of the Vecchio, at Naples, where the dead poor are thrown indiscriminately into pits, of which there are 366 in number, one for each day in the year. The pits are constructed under the pavement, about twelve feet square and sixty feet deep, and are covered by a large stone, provided with a strong iron ring, and by means of a lever resting upon a fulcrum, this stone cover is lifted from its seat. The bodies, usually naked, are brought to the pits in coffins, provided with hinged lids, and upon being removed they are let fall one by one, feet foremost, dropping upon a layer deposited a year previous. The pits are never cleared out, which explains in part why a different one is opened each day. Some writers have declared that quicklime was employed to dissolve the bodies, but this, I was informed, was not true. The practice surely is melancholy enough without the addition of this repulsive feature. How much more refined the pagan mode of burning the dead upon a funeral pile, and afterwards carefully collecting the ashes in urns, and then depositing them in the Columbaria, as in the time of ancient Rome—patrician and plebian all sharing alike. But still more refined is the true Christian burial, in a quiet spot, far removed from the danger of being hustled about in premature resurrection, by the opening of some new street or railroad.

The people of Bologna cherish the pious belief that they possess a miracle-working image of the Virgin, carved by St. Luke, who must have been a prodigious worker in wood, as there are numberless specimens of his skill in Europe. In order to give forcible expression to their faith, the Bolognese caused to be erected on the top of one of the surrounding mountains a fine church, which serves as a repository for the image. In addition to this they have incurred the enormous expense of constructing a covered portico, twelve feet wide and fifteen feet high, consisting of 635 arches, which commences at one of the city gates and extends up to the church, a distance of three miles. The religious sincerity of a people can scarcely be called in question, when they so freely spend their money to give it practical expression.

The railway northward, from Bologna to Venice, crosses the Po and Adige, and passes through the old cities of Ferrara, Rovigo, and Padua, the country being flat and fertile. A short distance beyond Mestre, at the junction of the road to Trieste, the railway approaches Venice, and crosses the lagoon upon a stone viaduct consisting of 222 arches of 32 ft. 9 in. span, the parapet being 14 ft. above water level. It was four and a half years in building, and serves the double purpose of a railway and fresh water carrier. What a strange city is this, and how beautiful is the first view. Appearing in the distance like a floating city, its domes, spires, cupolas and towers glittering in the sunbeams of a bright, cheerful day, one might easily imagine it one of those optical illusions presented by a mirage. Upon reaching the station we passed to the front entrance, where we were met by two gondoliers with blue sashes tied about their waists, who had been sent to bring us to the Hotel Europe. We moved down the grand canal, which runs through Venice in the form of a letter S, and constitutes the Broadway of the city, and to shorten the trip, we were turned into some of the narrower canals, and finally, after a ride of twenty minutes, were disembarked at the hotel, the front steps of which led directly to the edge of the grand canal, where gondolas are always in waiting to take in excursionists. At this point, also, the waters widen out toward the passages leading to the Adriatic.

From our window we enjoyed a most enchanting prospect. Within the line of vision, on the opposite side of the canals, we had fine views of the sumptuous church of Santa Maria della Salute, founded two centuries ago by a decree of the Senate of Venice, to commemorate the departure of the plague, which swept off 60,000 inhabitants. A little further down, upon another island, is the imposing church of San Giorgio—the church of the Greek rite, with its tall, brick campinale, and still beyond is San Lazaro, nearly covered by the building of an Armenian convent, where Byron studied this oriental language. Strange to say, this Christian convent, now in active operation, is protected by the flag of Mahommedan Turkey. Still further on is Lido, washed by the Adriatic, the spot selected by Byron for his own burial place. The whole picture, embracing a wide perspective of water and little islands, was very much hightened in the foreground by a spectacle which can only be witnessed at Venice. It was the opening day of the Carnival. The city was alive with fun and excitement. The little bridges and narrow footwalks were lined with people. Several hundred gondolas, usually black and funereal, now decked in the gayest trappings, and filled with joyous masquerading parties, were moving up and down the grand canal, the scene being enlivened by the strains of soft music, filling the ear with delicious sounds, while the eye feasted upon a scene of weirdlike enchantment and strange novelty. At sunset there was a temporary hush in the proceedings, the scene changed to starlight and gaslight, the effect of which, reflected on the water, was extremely pleasing and artistic.

The famous Piazzo San Marco is five minutes walk from our hotel. We can reach it through a narrow ally, or by gondola, but we prefer the passage by land, as the narrow streets leading to San Marco were to be filled that evening with masked people, dressed in grotesque and ridiculous costumes, and a grand carnival *bal masqué* was to take place in the open square, which we found most brilliantly lighted up for the occasion. There is no other spot like it in the world. On one side is the singular cathedral of St. Mark, in which are blended Grecian, Byzantian, and Venetian elegance and luxury, with an exterior resembling more a mosque than a Christian church. Near it stands the famous Ducal palace, a gloomy building, whose every apartment tells terrible tales of conspiracy, crime, cruelty, and blood. The doge who began it lost his head, and the architect was hung as a conspirator. Around the piazza, on three sides, are imposing buildings, projecting over to form arcades, and under which are fine shops and cafes, once the pride and luxury of the Venetians. Within this enclosure rises the majestic Campinale, or bell tower, 323 feet high, easily ascended by an inclined footpath without steps, and from which Venice is seen rising from the sea, with the crowd of surrounding islets, the Adriatic and the distant Alps—a sight to be forever remembered by those who are permitted to look upon it.

On the evenings of the Carnival, which continues through the week before Lent, the *piazza* is given up to joustings and frolicing. In the center is erected a large temporary platform for *bals masqué* and military concerts, and when the whole square is crowded with masqueraders, and lighted by thouands of gas jets and variegated lanterns, the effect is indescribable, reminding one of the enchantments in the stories of the Arabian Nights. The second evening was devoted to grand military music, commemorative of the battles of Magenta and Solferino, in which four superb bands took part, and to give a warlike effect to some of the more imposing parts, cannon were fired and rockets discharged. The crowd always behaved admirably. There was no crowding, no elbowing, no rudeness, no unnecessary noise; all seemed to be put upon their good behavior, and behaved with a pleasant regard for the rights of others. Such an exhibition would have been impossible in New York, where there are so many drunken, fighting rowdies.

I want to say a kind word in behalf of the pigeons of St. Mark, which have been a pleasing feature of Venice from its earliest days. During the government of the Republic they were fed every day from the public granaries, on the piazza of St. Mark; but when Venice was taken, in 1796, these innocent state pensioners were compelled to subsist upon private charity. Every day, the moment the great clock strikes two, the pigeons come flying in, from every direction, to get their rations. It is certainly a very interesting sight, and I hope the custom may not be forgotten.

What lover of the genius of Shakspeare could fail to be deeply interested in visiting the bridge of Rialto, the spot "where merchants most do congregate", and so little changed since the time of the Merchant of Venice that one might almost expect to see Shylock in his gabardine, holding parley with the noble Antonio and his friend Bassano. Here also is to be seen the house of Christoforo Moro, the Othello of Shakspeare. A statue adorns the front, which is supposed to resemble the Moor, as it has the shape and appearance of a well developed man, having a dark skin. In Venice also lived Marco Polo, the celebrated traveller; also, Titian, the great painter, whose marble tomb in the church of the Frari is one of the finest in Europe. Visit the doge's palace, wander about its stately and gorgeous apartments, ask the guard to conduct you over the Bridge of Sighs, upon which, tradition

says, there was once an inscription like this, "Who passes here leaves hope behind." I looked for it in vain, and concluded that the idea must have been borrowed from Dante, in his passage through hell, where he beheld written in dark characters over the portal, the words,—

"Abandon hope, all ye who enter here."

Enter the Piombi, or prison house, so much abused for its horrid dungeons, some of which, it is said, were actually built under the water. I took pains to inquire about this, and was assured that it was not true. The guard conducted me to the lowest cells, as he said, and I noticed that some daylight came through a small window above the surface of the water. The Piombi is bad enough, but no worse than many other European prisons of the middle ages. Enter St. Marks church, and examine its tessellated pavement of porphery and jasper, also its wonderful mosaic ceilings, in gold and colored marble. Look at its rich treasures, and examine the extraordinary collection of sacred relics, such as "sand that contains a few drops of the blood of Christ;" "a piece of the true cross and one of the nails;" "two of the thorns that pierced his brow;" "a small piece of his garment;" "some hairs of the Virgin;" "three stones that were thrown at St. Stephen;" "a piece of the pillar to which Christ was tied" (the original was shown to us in St. Stephen's church, in Bologna); "the thumb bone of St. Mark;" "the ring that he wore and the chair upon which he sat;" "the skull of St. Philip," and other rare things—such as precious stones, gold and silver vessels, and jewels of great value. All these things, and much more besides, which I cannot now enumerate, combine to make Venice one of the strangest and most interesting cities in the world.

Aside from the gorgeous decorations of St. Mark, it is supposed to contain the body of the evangelist whose name it bears. To use a mild term, the remains were *translated* without permission from Alexandria; for to say that they were stolen would be equivalent to charging a crime upon those Christians who piously perpetrated the deed.

Venice is a still city. No carriages can rumble through its narrow streets, and no other animals but mankind, cats, and dogs, are to be seen. Its ancient splendor is passing away, and ruin seems to be written upon its every feature.

S. H. W.

[By a comparison of dates, the reader will notice that the foregoing letter was written before the one which appeared in our last week's issue, but we publish it on account of its interest, and to complete the series.—EDS.

For the Scientific American.

THE MANUFACTURE OF FRENCH LEATHER.

To learn the secret of making French leather, or what is popularly known as fine fancy leather, has been a source of anxiety to the tanners of other nations for many years. Schemes have been thought of for the discovery of the mystery by leather manufacturers and others, but they have been hitherto unsuccessful. Chemists have been called in to solve the question and though analyzing air, water, food, and the mysteries of nature, their researches to discover the wished-for process of tanning leather, have been as ineffectual as those of the most unscientific tanner.

That the leather manufacture is indeed of national importance, witness the statement of Mr. Smull, an extensive manufacturer of this city, who at a late meeting of the Polytechnic Association, asserted that more hides were tanned in New York alone than in the cities of Paris and London combined. A description of the process employed in preparing the fancy and fine kinds of French and Russia leather may throw some light upon the subject under consideration.

The best kinds of kid leather are made from goat skins, on account of their lightness and smoothness, but cow hides and sheep skins are also used for the purpose. The first operation in preparing the leather is to put the skins into running water, where they are kept for one week, being taken out daily and thoroughly beaten with a wooden brake, a work of skill and patience, which effects the breaking up of the nerve and softens the fiber to a pulpy condition. Next they spend a month in a lye made of lime or ashes, of which the exact quality must be left to the judgment and experience of the operator. The hair is now removed and the alkaline properties are got rid of by soaking the skins in an infusion of white gentian in fresh water for twenty-four hours. The swelling of the skins is a matter of particular care, for which they are soaked four or five days in a mixture of oatmeal and water. They are now ready for the tannin, which is extracted from the bark of the willow. In the first solution the skins remain but three days, and are again beaten with the brake. The second solution, which is stronger than the first, retains them eight or ten days. After being taken out they are dried with the flesh side upward, again beaten, then greased, dried, and finished, using logwood and alum, and alum and green vitriol for the dark coloring. The mode of dyeing is peculiar. A number of skins are sewed up in the form of a sack, closed all around except a small opening at one end to admit the dyeing liquid. When the dye has reached all parts they are hung up to drain, then to dry, and again dyed with asparge, the whole process being repeated two or three times. Again they are greased on the flesh side and grained with a notched stick passing through the length and breadth of the skins until small furrows are gradually produced. After graining, another greasing is necessary, this time with birch or linseed oil, and they are put on the wooden horse to be smoothed. The birch oil gives the leather a peculiar smell which distinguishes it from that prepared by any other process.

There is no article of manufacture in the United States or in the world of more importance than that of leather, and some process for converting raw hides into upper or sole leather in a short number of days or a few weeks would be of the greatest national importance. The present mode of preparing leather necessitates a long and tedious process, which makes serious inroads on the profits of the tanner, and consequently the necessary time is not allowed for properly converting the raw skins into leather, and thus the community have the sad experience that neither sole nor upper leather is impervious to water, and the wearer of the shoe made from it suffers from damp feet, and finally goes into a decline, a practical view of the case that alone should be sufficient to arouse the inventive talent of the American people for the discovery of a quick, trustworthy tanning process, which would speedily bring a fortune to the inventor.

The French tanners use valonia and oak bark with either caustic soda, carbonate of soda, ammonia, or carbonate of ammonia. By the use of these substances a considerable saving in time in the preparation of the skins is effected, and the leather is said to be of superior quality. The tanning is facilitated by means of a roller to which a slow motion is given by steam. The moving of the hides in the bath, the usual process of liming, fleshing, and unliming is carried out, and the skins are then submitted to the action of a bath composed of a solution of extract of valonia or other tanning material. Carbonate of soda is to be added in such quantity that the bath shall be raised 1° on Raumer's hydrometer, the bath then marking 2° on the hydrometer. After three days the skins are removed to a second bath, composed of a solution of valonia of 3°, strengthened one degree as before by adding caustic soda or carbonate of soda. After lying in this bath for four days, being turned several times a day, the skins are transferred to a third solution of valonia, marking originally 7°, but by the means as above, increased one degree in strength. In this liquor the skins are immersed for seven days, when the coarsest kinds must be changed to still another bath, marking, with the added carbonate of soda, 10°, wherein they are to remain for nine days, being turned three or four times during that period.

In the case of ordinary hides they will not need to be subjected to the action of the bath in which thick hides are treated, but they should be transferred from their own bath and allowed to remain seven days, to the final bath, which is composed of the extract of valonia marking 9° on the hydrometer, the bath marking about 10°. Between each hide or skin as they are placed in the bath, about six pounds of oak bark and six pounds of valonia are strewn, and they are allowed to remain therein for fifteen days, when they are removed and finished in the usual way. Finally the process is hastened and the labor of handling the hides lessened by fixing over the bath a roller or winch to which a slow motion is given by a steam engine. The hides are fastened together end to end, and then motion is given to the roller by means of the steam engine, so as to move the hides at the rate of four or five a minute. When the process of moving the hides and agitating the liquor is employed, a stronger bath may be used, beginning at the first bath at 2° of the hydrometer, the hides being regularly moved in the daytime and remaining in the solution two or three days. They are then to be taken out and put into the bath No. 3, marking 7° of Raumer and 1½° of the alkane mixture and to remain in the bath from four to five days, being moved around as before, after which they are placed in the finishing bath with oak bark or valonia scattered between. An example has been made of the properties of the carbonate of soda to be employed in the different baths, but when the other alkalies or other alkaline carbonates are to be used, such as ammonia or carbonate of ammonia, they are used in the same proportions as carbonate of soda, but not marking the degrees given for carbonate of soda, as the density of the solution will vary with the different alkalies. The skill of the mechanic has done more to expedite the preparation of the leather than chemistry, but the great difficulty is, that in quickening the process the quality of the leather is not so good, so that when the best kind of leather is required the old slow method must be adopted.

Catechu will produce four or five times the quantity of leather that oak bark will. A considerable quantity of this tannin is used, but the quality of the leather from catechu is not equal to oak bark tanned leather. The process is much quicker and the tanner is able to save time by the use of catechu; nevertheless the action of this substance on the leather is not satisfactory, as the leather is soft and spongy and absorbs moisture.

Valonia is the fruit of a tree which is known by the name of "acorn cups;" it comes from Italy, Turkey, and the East Indies. The leather tanned with valonia is not liable to absord moisture, and for this reason is preferred by many to oak bark, and presents the advantage of imparting to the leather a smooth, soft, and nice texture, which is thoroughly impervious to water. Two pounds of this tannin will make one pound of leather.

Catechu is taken from a tree, acacia catechu, which grows mostly on the Malabar coast. The sap or bark of this tree is boiled, the solution evaporated, and the astringent matter is taken by this process. There is another kind of catechu brought from the East which is known by the name of gambir. This is collected on the shore of the Malacca; the wood, bark, and leaves are boiled in water, and when evaporated there is added sago to give it a body; it is then dried in the sun ready for use. Five thousand tuns of this catechu, better known as gambir, are annually exported from Rhio by the Chinese. It yields forty per cent of tanning matter. This substance of catechu, or kassu, as the natives call it, has been introduced into Europe, but has not as tannin yielded satisfactory results. Sumac is used for the preparation of Spanish leather. It is said to harden the leather. It is quite expensive, its cost varying from $100 to $150 per tun, and is chiefly used by the glazed leather manufacturers. Devi-divi is also used in tanning operations, but has the bad reputation that leather tanned by it is porous and consequently absorbs moisture.

Birch bark is used in Ireland for tanning bazils. It contains 7 per cent tanning matter. It is also used in France for making the fine red leather and other fine kinds known as Russian leather.

Hemlock is principally employed in tanning in this country, and such leather is porous and absorbs moisture. It is likewise stiff and hard, and presses on the feet.

Elm bark is very generally used in Norway for making leather, and it is said the fine Norway gloves are prepared from the elm bark, and that the softness and beauty of the leather are attributable to this bark. The white willow is used in Denmark for the manufacture of gloves. Russia also uses this bark in the manufacture of fancy leather, and the leather being impregnated with the oil of birch bark, which gives it a peculiar, agreeable smell. It is a noteworthy fact that the Norway tanners use birch and willow in preference to oak bark.

France uses the bark of a species of oak known as komes oak, a stunted shrub growing in the south of France. This species of oak is in clumps, and grows in hight to about three feet. The shrub which is called coppice oak has roots of a yellow brown hue, and is very rich in the tanning principle, and is used in France for tanning sole leather of first quality. Vaugrelin, by chemical analyses, found that kino contains 75 per cent of tanning property. Esanleck found that terre-japonica or gambir contains 40 per cent. White willow, according to Davy, contains 16 per cent; birch bark, 1·6 per cent; beech bark, 2 per cent; weeping willow, 16 per cent; sumac, 16 per cent; and sassafras root, 58 per cent of tanning matter.

For the removal of the hair and other extraneous matter from the skin, some of the French tanners use acids; others employ a bath of sour milk for the purpose. The acid ferment of milk and barley meal is acetic acid, and is found to be very efficacious for the separation of the hair and other substances from the skin. Sulphuric acid is a good agent, but from its causticity is very likely to injure the leather if not used with great care. The process of sweating, which is adopted in the United States, is known to all experts in the trade, and it is needless to expatiate on it.

The process of oak tanning is of such general use and so familiar to the trade that it is of no interest, or there is no novelty in the process that is not familiar to all tanners.

The vapor of steam has been introduced for removing the hair, a method that finds great favor in France. The hides are hung up in a close room the floors of which are perforated with holes, through which steam is admitted. By this process the hair becomes soft and is easily scraped off with the hair knife, and a quick process is afforded, and one having the advantage that the hides cannot be injured by putrefaction, as with the ordinary tanning processes.

THE WATCH---ITS HISTORY AND MANUFACTURE.

By H. F. Piaget.

Toward the middle of the sixteenth century springs were applied instead of weights as the maintaining power to timepieces, thus enabling them to be made small and portable; but these pieces, now called watches, were imperfect machines, going with even less precision than an an old clock; they had only an hour hand, and most of them required winding twice a day. Scarcely more than a century has elapsed since watches were nearly completed, with the exception of the external parts, by individual labor alone.

The art of watch making is now divided into more than thirty or forty different branches, according to the different kind of watch made. By machinery and a division of labor, watches are now made at a much lower price than formerly; but for their greater perfection we are indebted to improved principles. The English were the first successful manufacturers of watches; all the escapements applied to good ones, whether at home or abroad, were invented by them. It is true that many ingenious contrivances have been introduced at different times by French and Swiss artists, but they themselves have ceased to apply them: and with the exception of the vertical (the inventor of which is unknown), they generally adopt those principles only which were first devised by English watchmakers. The horizontal, or cylinder escapement, by Graham, the lever escapement, by Mudge, the duplex, invented by Dr. Hook and perfected by Dyrer, while the detached or chronometer escapement, although invented by Berthoud, is indebted for its accuracy to the improvements by Arnold, Earnshaw, and Dent.

The discovery of the art of piercing holes in rubies for pivot holes to watches, is attributed to M. Fazio, a native of Geneva, who having failed in his attempt to get his plan adopted in Paris, went to London in 1700, where the art of watchmaking was rapidly advancing. He was well received, and his plan being very generally adopted, added greatly to the reputation of English watches The rubies are still used in good watches; they are the hardest stone that can be drilled, but at the present time cheap watches are jewelled with all kinds of stones, as crystals garnets, etc., they being cheaper: English and American watches have however usually the jewel over the upper part of the balance made of diamond, it does not require to have a hole through it, the pivot resting on the end instead of a shoulder, as in the wheels, on account of the extreme freedom required. The English being a maritime nation, their attention was early directed to the improvement of marine chronometers, and their researches enabled them to give an accuracy to pocket watches, which rendered them preferable to all others. The French have never been able

to establish a large or permanent manufacture of watches, although from the exertion of several eminent men, as Le Roy, Breguet, and Lepine, they have produced them of a very superior class. They were the first to reduce the size of the old watch, and from the high price not unfrequently given, they could afford to bestow much care and time upon the construction, so as to produce astonishing precision in the small watches. The Swiss have become the largest manufacturers of watches in the world; this arises partly from the absence of other branches of industry, but principally from the low price of labor; also from the number of females and children who work at the business, (the writer commenced when only seven years old,) enabling them to produce at so low a rate as to have entirely superceeded the French watch. The cheap and showy watches which inundate the windows of jewelers, dealers in trinkets, etc., in every country, as well as those advertised as so cheap, are principally of Swiss manufacture; but if English, they are generally of an inferior quality.

In the reign of William III., of England, it was considered necessary to pass an act obliging watch makers to put their names upon all their watches, to prevent the discredit to which the manufacture was exposed from the bad watches sold abroad as English.

Different governments have endeavored to enforce protecting duties. Twenty years ago, all foreign watches imported into France for the purpose of sale, had to be stamped, to show that they were not of French make, and that the duty had been paid; this stamp (a bull's head) could be seen on nearly all the watches sold in Paris at that time. It was generally put upon the pendant, but occasionally on the other parts of the case. In England there was a duty of twenty-five per cent on the importation of foreign watches for sale. Those for private use were admitted on a fine of five shillings each, and a recent law enacts that they shall have the maker's name and place of abode engraved upon the movements.

There is, however, no stamp, as there is in France, and smuggling is carried on to such an extent as to render the duty ineffective as a protection to trade, and of little value to the revenue; while in many instances where the duty has been paid, fresh names are engraved upon them, and they are sold as having been made in England. For the protection of the American manufacture of watches, some plan should be adopted to be enabled to distinguish the genuine from the false, for the American watch is at the present time imitated abroad, and many persons may yet be deceived when they think they are encouraging home manufacture, are wearing watches (the case perhaps excepted,) of foreign make.

Watches and movements are imported in this country, particularly the cheap kinds, which have the names of some celebrated maker engraved on; others, with the name of makers long extinct, or of some which never existed. This can only be prevented by applying to an honest and upright watchmaker or dealer, who will not deceive you, if he values his reputation.

More rapid production and better workmanship in the detached pieces or parts, are the natural results of a well matured system of division of labor; but sub-division for cheapness alone, is destructive to the unity necessary to produce a good watch; hence, while lowness of price is a point of competition (and to meet the demands of society it always will be), the greater number of watches must be of an inferior kind.

The great difficulty of establishing this manufacture, even under the most favorable circumstances, has been amply shown by the failures of those in France; while those in Germany have been equally unsuccessful.

There are manufactories of watches in this country which make a very good time-keeper, and are continually improving; but a great help to them would be a heavier duty on foreign watches and movements. This I hope will be done, and that the American watch will be successful.

The English and Swiss are now the sole exporters of watches, and they may be said to supply the world. Swiss watches are handsome—their size also in perfect accordance with the present taste—and did the production of the two countries differ in price only, this manufacture would be lost to England as it has been to France.

No one doubts that it requires a certain skill to make or mend a watch, yet many doubt that it requires certain knowledge to choose one, and, when chosen, certain care to use it.

Care will go a long way, but not all the way; to care must be added some knowledge to give the right direction to its exercise.

My lengthened experience has taught me that numbers of valuable watches are often ruined by the want of care or skill in their use, and then the blame is laid at the door of the watchmaker.

A man buys an expensive watch, and naturally expects it to perform well; he misuses it, and it either stops altogether or performs badly; he exclaims, "I have been duped in buying that watch." He takes it to a third party to set it to rights; that done, he again misuses it, or some unavoidable disarrangement happens to it; he then declaims against all watches and watchmakers.

Thus a watch, which should be an article of use and ornament to its owner, is too often only a source of vexation and expense.

Now I propose partly to remedy this, not by attempting to make every one his own watchmaker, but by imparting, in a familiar manner, such practical hints of the construction and the use of a watch as will enable them to use it properly, and guard against some of the annoyances and expenses which, without such information, they are liable to incur, as well as prevent the watchmaker or repairer being frequently erroneously blamed.

The inexperienced in the trade will also find many suggestions which may be useful to them, for they must know that a good watchmaker is not always a good repairer; for, owing to the variety of different kinds of watches that pass through his hands, practice must be added to knowledge and skill, to properly repair a watch.

MORSE'S PLAN FOR CENTERING AND PACKING BOBBINS.

When wooden bobbins are used in spinning woolen or cotton yarn for weaving, there is some difficulty in properly centering the bobbin on the spinning spindle; the caliber of the bobbin becoming worn, it will not adhere sufficiently to the spindle. The temporary expedient of putting between the spindle and the interior of the bobbin a bit of waste or roving is a poor plan, troublesome and wasteful. Any packing intended to be permanent should be able to resist the action of the steam which is used for taking the kinks out of the yarn. The object of the simple device seen in the engraving is to prepare the bobbin for the reception of a packing that shall be effectual and shall center the bobbin on the spindle as perfectly after it has been steamed as before.

As will be seen, Fig. 1 is a miniature lathe or drilling

Fig. 1

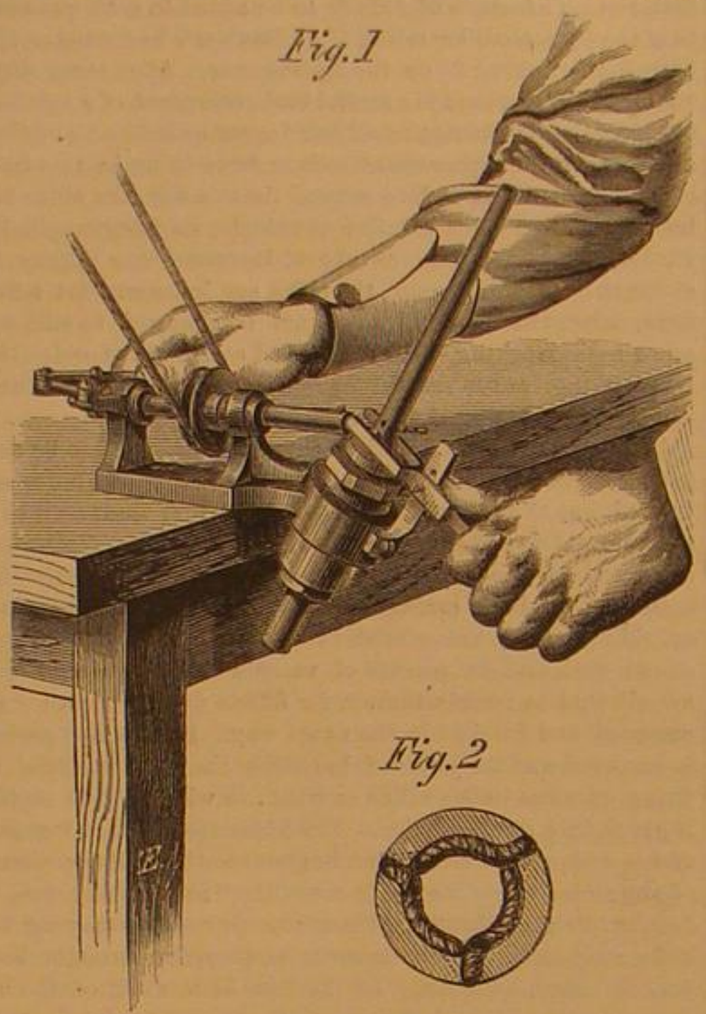


Fig. 2

machine attached to a bench or table. It is driven very rapidly, carrying in its spindle a twist drill. The spindle is advanced to the work, or drawn back, by a lever as in many other drilling machines. The bobbin to be drilled is placed on a stud corresponding to a portion of the spinning spindle, which stud is held in a hollow cylinder passing through a bearing bored eccentric to its support, which stands at an angle to the horizontal boring shaft. The bobbin to be drilled is held firmly to place by a forked lever bearing on its base, and is further retained in position by three sharpened pins inserted in the base of the cylinder on which the bobbin rests. The support of the bobbin, being eccentric to the bearing, the bobbin presents its side to the drill. A ratchet and pawl inside the bearing allow the bobbin support to be turned one third of a revolution and hold the bobbin securely in position while being drilled. The holes thus drilled pass diagonally across the bobbin near the base, cutting into the caliber of the bobbin. Through these holes is passed a bit of twine or rubber, the wood between the holes on the outside being grooved out so that the packing will not project beyond the outer surface of the bobbin. Fig. 2 is a transverse section showing the intersection of the holes and the packing in place. When the packing is in the holes the substance of it, as seen in Fig. 2 will project equally into the bore of the bobbin so that when the bobbin is placed upon a spindle the parts thus projecting will bear upon its sides uniformly and secure the bobbin firmly in a central position. The holes may be bored in any part of the bobbin and at any angle desired, as the parts of the machine are adjustable.

Patented through the Scientific American Patent Agency Feb. 11, 1868, by C. B. Morse. Patents abroad have also been solicited through this office. For further information address "Union Iron Works," manufacturers of and dealers in all kinds of cotton and woolen machinery, Rhinebeck, N. Y.

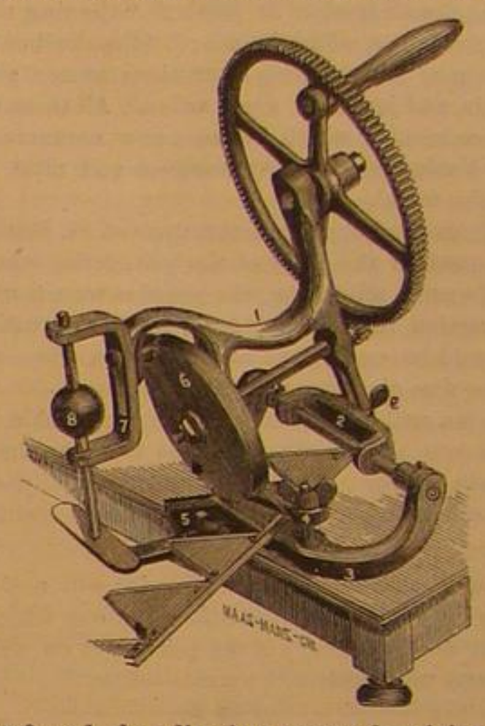
Embalming.

The efforts which have recently been made to discover an efficient, quick, and inexpensive process of embalming dead bodies, seem crowned with complete success. A subject treated by the process of Professor Seely was examined recently by Professor Wood and a company of distinguished gentlemen, at the Bellevue Hospital, and although it had been kept one hundred and three days, it was found in perfect preservation. It was without smell, and the face presented a naturalness that was startling. It is claimed for this process that it arrests decay at once, and the examination of the body substantiated the fact. No injection is made in the veins, nor cut or incision in the body. A simple wash, applied externally, effects the change. It is claimed that the bodies embalmed will last a century. The learned professor of the hospital expressed himself astonished at the result, and, in response to a question of Mr. Clark, the agent for the patentees, replied, "I never saw anything like it in my life." The process has been patented, and the agent for the sale of rights is W. B. C. Clark, 713 Broadway.—*Home Journal.*

[The combination of materials used, and the mode of application in embaling is fully described in the Scientific American of April 11th. The discovery is one of vast importance and the patent of Professors Seely and Eames promises to be of great pecuniary value to the inventors.—Eds.

THE EXCELSIOR GRINDER FOR MOWING AND REAPING MACHINES.

A handy implement for grinding the teeth of reaping and mowing machines, now so generally used throughout the the country, is certainly a desideratum. It is a work requiring skill and care to grind these triangular knives on an ordinary grindstone, where the bevel of the teeth must be assured wholly by the nerve of the workman. Such a machine is seen in the accompanying engraving, where the grinding or emery wheel is shown by Fig. 6, the frame of the machine by 1, the shaft upon which the driving wheel and grinder is



pivoted by 2, and the adjusting screws for giving any angle required to the grinder by 8 and 9. Fig. 5 shows a screw for adjusting the bed plate, holding the tooth plate at the angle desired, and 4 is a screw clamp for securing the plate to the bed. This device can be taken into the field and operated by hand, grinding the teeth more perfectly and rapidly than by any other method. When cutters are ground by the old process the point of the tooth is soon ground off, and the grass clogs between the point of the tooth and the finger bar. With this machine, the angle can be so adjusted as to preserve the length of the tooth, overcoming this difficulty, and the cutter will outwear two ground by the old process. It is cheap in price and simple in construction, and always grinds the teeth to a uniform angle. It is made wholly of iron, in a substantial manner, and weighs, complete, only about sixteen pounds. Its advantages are apparent to any one using mowing machines, without further description.

It was patented Feb. 18, 1868. All communications should be addressed to Mellen & Doane, No. 32 Reynolds Block, Chicago, Ill. State and manufacturing rights are for sale.

Science in a Toy.

A very amusing application of frictional electricity has been recently patented by Messrs. Funston and Blockstone, 912 Market street, Philadelphia, Pa., in the shape of a small ornamental, shallow box, having for its bottom a plate of looking-glass. Another sheet of common glass forms the cover, and there is a space of perhaps an inch and a half between the two glasses. A variety of figures cut out of paper, or other light substance, are laid upon the looking glass, and on gently rubbing the surface of the upper glass with a handkerchief or a piece of paper, the several figures become electrified, assume the erect position, and dance about at a great rate, much to the amusement of lookers on. When not in use the box may be hung up to serve as a mirror. The makers furnish a great variety of forms of these toys, and the prices run from fifty cents upward.

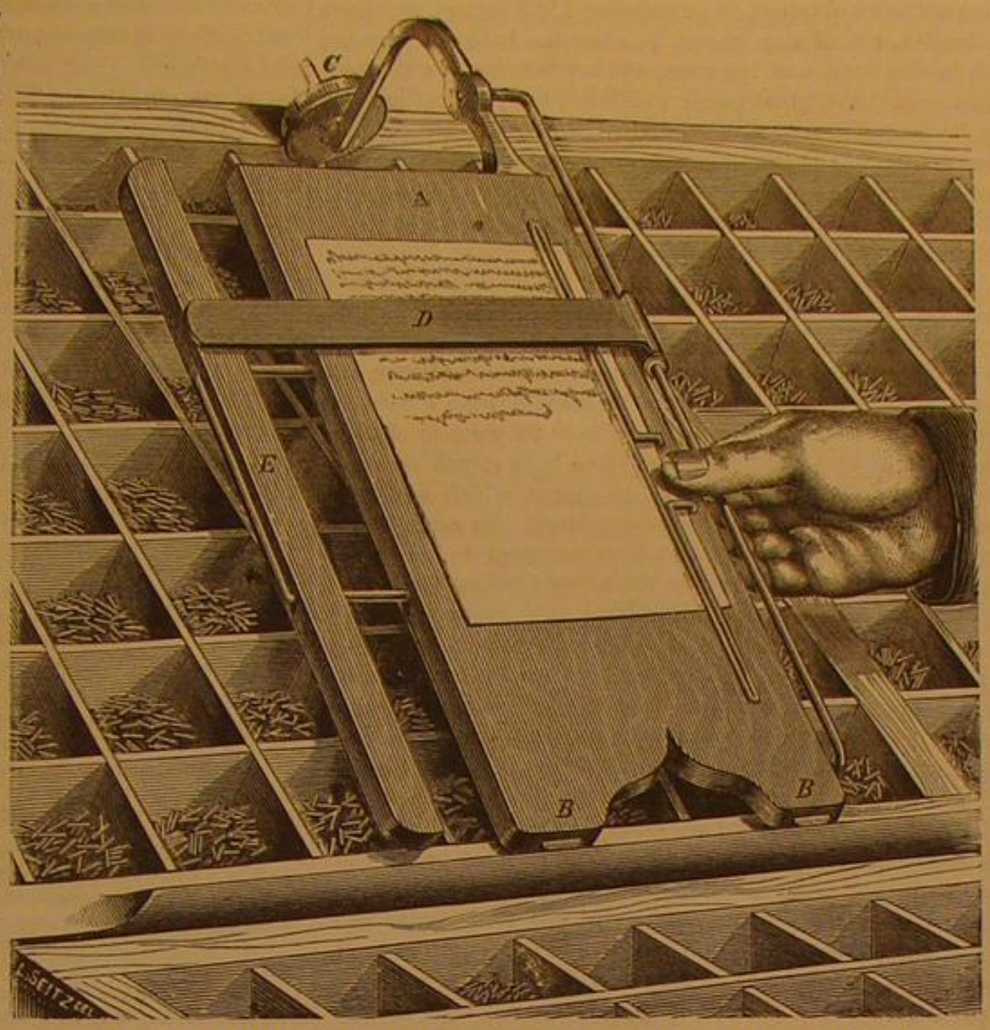
New Galvanic Pile.—A new galvanic pile has been constructed with chloride of silver, for the negative element, by MM. Warren de la Rue and Hugo Muller. This pile, though of exceedingly small dimensions, is extremely powerful. It consists of a zinc rod, which need not be amalgamated, and of a thin silver wire coated with a certain quantity of chloride of silver applied to it in a state of fusion. This is the negative, the zinc the positive element; the whole apparatus is not three inches high. The liquid used is a saturated solution of common salt. With ten couples, constructed as above, acidulated water will be rapidly decomposed. While the apparatus is working, the solution of salt becomes gradually charged with chloride of zinc, which only serves to increase the power of the pile; but care must be taken to change the solution as soon as metallic zinc makes its appearance on the negative element.

Strength is power only when exerted in some way which utilizes the strength. Exerted to no useful purpose it is worse than wasted.

Improved Copy Holder for Compositors.

It is not unfrequently the case that copy, intended for printers' use, is required to be kept clean and returned to the writer in good condition. Manuscript laid on the printer's case will, however, become soiled unless great care is used by the compositor. If a window is left open the manuscript is liable to be disturbed, and other annoyances attend the present *loose* way of using copy. The object of the device shown in the engraving is to prevent all these annoyances, a result we know from actual trial in our composing room, it will do.

The copy holder consists of a platform, A, made of thin board, bound with sheet brass on its edges, if desired, having rollers on its lower edge, as at B, and a gooseneck sustaining a roller, C, at the upper edge, intended to facilitate the movement of the device from one side of the case to the other, their position and action being plainly shown in the engraving. The guide, D, is a blade passing across the copy board hinged on a rod extending down the side of the device and held in place by a gland of rubber or leather on the rod. The copy is held on the platform by a bent or double wire, or other device, actuated by a coiled spring under the platform—not shown in the engraving—the position of the hand alone showing its action. This wire holds the copy, and by the spring it may be moved as the occasion may demand. The bar, E, is an extension of the device intended to accommodate wide copy. It is guided, as seen in the engraving by a square staple of wire entering the substance of the platform.



LA FRANCE'S PATENT COPY HOLDER AND GUIDE.

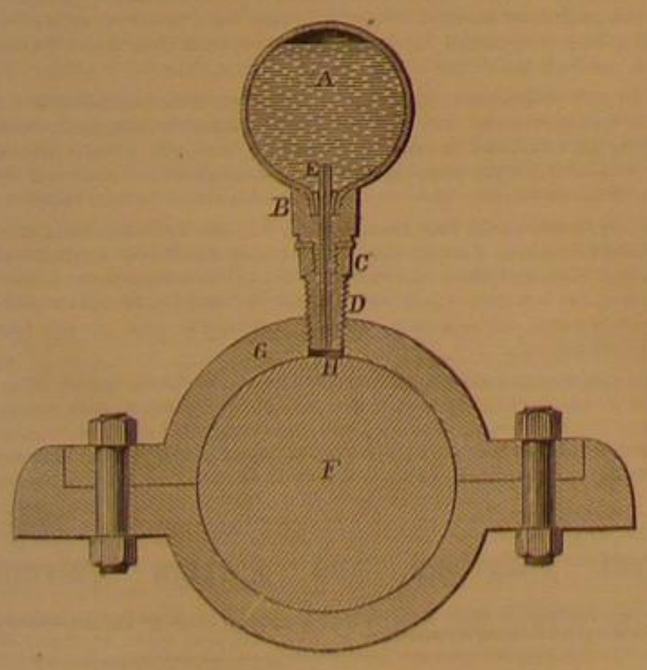
The patentee enumerates the advantages of this device as follows: The facility with which it may be moved from one side to the other, leaving uncovered any portion of the case from which type may be wanted; avoiding the soiling of the manuscript by frequent handling and contact with the type; giving a better view of the manuscript by its being raised nearer to a perpendicular position by means of the gooseneck support at the upper end; and the effectual holding of the copy, keeping it perfectly flat and preventing its movement by currents of air.

Patented Nov. 12, 1867. Orders for the holder and all communications relating to it should be addressed to the patentee, Mr. P. A. La France at Elmira, N. Y. By a slight modification of the device the inventor adapts it for copying manuscript, etc., and has received orders from a great number of concerns doing such work, and from the different governmental departments at Washington. Our experience with the device has been very satisfactory.

HILBERT'S SELF-ACTING LUBRICATOR.

This lubricator, secured by letters patent to Benjamin Hilbert, of Cincinnati, Ohio, is thus described, reference being made to the accompanying engraving, representing a vertical section:—

A is a transparent reservoir for oil upon the neck of which



is cast a metal socket, B. C is a nipple screw, firmly adherent to B, and making a joint with the upper nut-shaped end of D, which is a brass screw, for attachment to the cap over a journal. E is a brass tube passing through B, C, and, D, and fitting snugly in D, its upper end rising a quarter of an inch, more or less, above the neck of the reservoir into the oil, its lower end being adjusted to not less than 1-16, nor more than ¼ of an inch above the journal. The application of the lubricator to a bearing is shown in the cut, where, F, is the journal, G the cap, and H the space between the end of the inner tube, E, and the journal.

The screw, D, is designed to be permanently attached to the cap, G, the reservoir being removed for filling by unscrewing C. From the shape of the reservoir, A, and the small diameter of the passage through the tube, E, it results that no oil will escape from the lubricator while the journal, F, is at rest; but the journal being in motion, the agitation of the air in the space, H, together with the ordinary suction created by such motion, causes the oil to flow slowly or rapidly as the agitation and suction are greater or less; *ergo*, according to the velocity of the journal.

The peculiar advantages of this lubricator over all other contrivances for the same purpose are claimed to be as follows: Its greater simplicity. Its non-liability to be gummed and choked up by any impurities in the oil or on the journal. The upper end of the tube, E, rising into the reservoir, allows any impurities in the oil to settle around it and not in it, while the lower end, standing entirely free of the journal, will not catch or take up any gum, or impurities moving thereon. Its being completely automatic in its operation, having no shaking wires, felting, wicking, regulating screws, or other parts liable to become inoperative through inattention. Once firmly attached to a bearing, it requires no attention beyond being filled when empty, the necessity for which can be readily seen through the transparent reservoir. Its economy of oil. Its applicability to bearings in cold rooms, where, in winter, the oil congeals. The least warmth in the bearing is communicated to the tube, E, which transmits it to the oil, rendering it liquid.

The general agents for the sale of this Lubricator in the Eastern States are R. M. Graham & Co., No. 81 Nassau st., after May 1st, 55 Liberty st, New York city.

Spontaneous Generations.

In a late French publication to which we have already referred, M. Pouchet brings forward among others the following facts in favor of the hypothesis of spontaneous generation. There exists, says the author, vegetables which show themselves only in circumstances so exceptional that it is impossible for us to imagine their seeds encumbering the atmosphere during centuries, in order to fertilize, at only rare intervals, some point of the globe. A fungus is known which develops only on the corpses of spiders, another which grows only on the hoofs of horses in a state of decomposition. The *isaria* has as yet been observed only on certain night butterflies; there are other species which invade the larvæ and chrysalides. Hooker has discovered a fungus which attains considerable dimensions (from 10 to 12 centimeters), but which is found absolutely only on the neck of a certain caterpillar in tropical countries. It vegetates on the animal, fructifies on it, and the caterpillar buries it with itself in the ground, whence it springs like a funeral plume. "Must it be then," says M. Pouchet, "that the air has been crammed with seeds in order that one should fall from time to time on a dead spider or on the neck of a caterpillar?" As a particular vegetable invades each species of fermentation, it would be equally necessary that the germs of all these microphytes should have floated in the atmosphere from the creation until the day a new fermented liquor was invented. Still more, a singular vegetable is known, the *racodium cellare*, which has never been found except on the casks in wine cellars, and another which lives only on the drops of soot which the workmen let fall on the soil of mines. "Have the seeds of these vegetables remained without use from the origin of the world to the day that they found their proper soil?"

A POWERFUL PRINTING PRESS.—M. Marinoni has put up in the new printing office of a popular daily paper of Paris, called the *Petit Journal*, a marvellous machine of his own invention which prints 600 copies a minute. Four of these powerful presses turn out 144,000 copies an hour, the whole impression of 446,000 papers daily, being worked off, it is said, in a little more than three hours.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Process for Casting Steel under High Pressure.

MESSRS. EDITORS:—I saw in a recent number of the *Public Ledger*, Philadelphia, a general notice that steel castings are made sound and free from air bubbles by being compressed by gaseous pressure—that it is quite successful in France. In order that your readers may have a correct idea of the process I annex an extract from Antoine Galy-Cayalat's U. S. patent, Feb. 19, 1867:

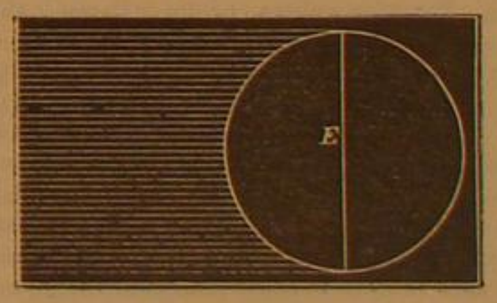
"It is well known that cast steel run into molds is subject to blister, and is otherwise porous, which defect reduces considerably its toughness. In order to give this metal its requisite tenacity, it is subsequently reheated and then rolled and hammered, As many articles, such as cannon, cannot be treated in this manner, I have devised to submit them to a high pressure while in a liquid state inclosed in their sand molds maintained in iron flasks. For this purpose, immediately after running a cannon, I cover hermetically the head by a metallic cap, by means of bolts or other devices attached to the flask. This cap is fitted in its center with a vertical pipe, and provided with a cock at its lower extremity, while its upper extremity is closed by a washer pressed with a bolt in such a manner as to act as a safety valve. Before attaching the cap at, supposing an inch from the surface of the liquid metal, I introduce in the vertical pipe, and between the cock and the washer a charge of about one quarter of an ounce of gunpowder, in the proportion of eighty parts of saltpeter and twenty of charcoal, with no sulphur. On opening the cock this powder falls on the metal, ignites, and engenders about one third of a cubic foot of gas at 1,400° Cent. These gases exert on the liquid metal a pressure which is transmitted through the entire mass, thereby condensing the same and expelling the blisters. The effect thus produced is equivalent to the pressure of a head of liquid metal ninety feet high, admitting that the capacity between the cap and the surface of the metal contains thirty cubic inches. By making the flasks sufficiently strong the charges of powder may be varied, so as to produce by its ignition a uniform and general pressure, which is preferable to the partial, irregular and momentary action of a hammer."

JAMES HENDERSON.

New York City.

Do We See the Sun so soon as it Rises?

MESSRS. EDITORS:—It is laid down in books that, as it takes light eight minutes to come from the sun to the earth, we do not see the sun until eight minutes after it has risen. Now, I hold that the sun, being stationary, and pouring a steady stream of light against the earth, we shall be able to see the sun the instant we are carried by the rotary motion of the earth up to the point where the sun's rays can strike us. It is intended to leave out of the problem refraction and other disturbing elements.



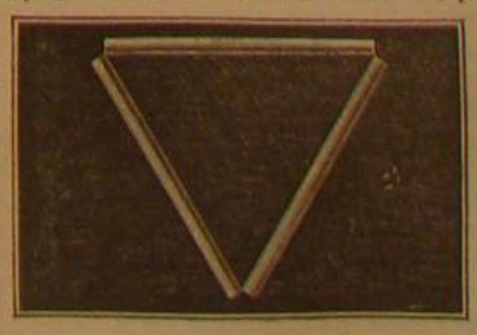
In the diagram, E represents the earth, and the parallel lines the sun's rays. Owing to the immense distance of the sun these rays are as nearly parallel as could be represented in an engraving.

Perhaps it may amuse some of your readers to try the solution of this problem. G. B.

[The above was probably the last contribution of our esteemed and lamented co-laborer, George Bartlett, whose sudden and untimely death we noticed in our last issue. He wrote it only two days before his death, and it is evident from its construction and its brevity that he intended it for an introduction to other articles on optics, a subject he understood, probably, as well, if not better, than many scientists whose names are more widely known.—EDS.

Optical Illusions.

MESSRS. EDITORS:—On page 211, current volume of the SCIENTIFIC AMERICAN, a correspondent asks, under "Curious Optical Effect," "Will some one, etc., please give us an explanation of this deception?" I would say, that if J. Herva has always exhibited the two bars as in his diagrams I do not wonder at his friends' conclusions, because the upright is really longer than the horizontal bar by the thickness of the latter. This will make some difference at least! Therefore I think that J. H. would reach the bottom of the illusory experiment more effectively were he to try it by the triangular process. Both he and his friends could turn all angles round to the eye, and see if the same illusory results followed. J. HEPBURN, SEN.



Gloucester, N. J.

Improved Compound of Aniline Colors.

Emil Zinssmann, of New York city, has lately patented the following:

"This invention consists in a compound, which is soluble in water, and made of aniline colors, which, in themselves, are not soluble in water, by treating said colors with glue or gelatinous materials, or with different kinds of gums, such as gum arabic or gum tragacanth, or with starch, which is soluble in water, or with other equivalent materials, either alone or mixed together, in combination with either acetic acid, or glycerin, or saccharine solutions or decoctions of plants, or any other liquid which will produce the desired effect; said materials being combined mechanically to a thick sirup-like homogeneous mass, and then mixed together with the aniline color (which is to be rendered soluble in water), and heated in such a manner that a product is obtained which retains all the coloring properties and qualities inherent to the aniline colors, and which is so perfectly soluble in water that it can be used with the best success for dyeing and printing all fibrous materials, and consequently the expensive operation of dissolving the aniline colors in alcohol, which, with aniline colors as now made, is indispensable, particularly for dyeing and printing wool or cotton, or fabrics made therefrom, can be dispensed with.

"In carrying out my invention, I proceed, for instance, as follows: I take a quantity of glue (about from two to six pounds of glue to one pound of the color), and dissolve the same in common acetic acid of seven or eight degrees, so as to form a thick, sirup-like mass. With this thick solution I mix the aniline color previously reduced to a fine powder, and then I work the mass until it forms a fine thick homogeneous pulp, either by means of suitable stones, or by passing the mass through a mill, or in any suitable manner. The pulp thus obtained is then placed into a suitable vessel (best an enamelled kettle), and heated in a water bath under constant agitation or kneading, it being desirable at the same time to provide the vessel containing the pulp with a tightly-closing cover, so as to prevent the undue evaporation of the liquid parts of the mass. It must be remarked, however, that the desired reaction, or, in other words, the perfect dissolution of the aniline color in the glue, or the equivalent material, will take place only and best when the pulp in the water bath forms a mass of such thickness and consistency that it just can be kneaded or stirred. If the pulp should, however, become so thick that it cannot be stirred or kneaded before the aniline color is perfectly dissolved in the glue or eqnivalent material, the addition of a small quantity of the corresponding liquid is sufficient to reduce the pulp to the desired consistency. From time to time a small quantity of the pulp is taken out, dissolved in hot water, and while hot passed through a filter, and if no color remains on the filter, the process can be considered completed, and the product can be used immediately, or it can be dried and preserved for future use.

"For purple aniline colors, with the exception of the bluish purple, such as "Parme," or of the aniline blue, about two or three pounds of glue or gelatine to one pound of the color are sufficient, but for bluish aniline, such as "Parme," or for aniline blue, it is better to use from four to six pounds of glue or gelatine. For blue aniline, or for "Parme," the use of glue and acetic acid is to be recommended, but for purple aniline I can use gums, or starch which is soluble in water (dextrine), and the acetic acid can be replaced by glycerin or decoctions of plants, such as soapwort (*Radix saponica*), or materials of a similar effect, and this change is to be recommended, because the acetic acid affects and injures the hue of the purple aniline colors. If glycerin and glue are employed, it is necessary to soften the glue first in a small quantity of water, and then to effect the combination of the glycerin and glue by heating them together.

"By this treatment I am enabled to produce from aniline colors, which in themselves are not soluble in water, a compound which is perfectly soluble in hot water, thus forming a solution which is applicable with great advantage in place of the expensive and unreliable alcoholic solution of said colors. The great saving effected thereby is apparent from the fact that at present, for the purpose of dissolving one pound of purple or blue aniline colors (particularly for the purpose of dyeing or printing woolen and cotton materials), from twenty to thirty pounds of the strongest alcohol, or a still larger quantiy of methylene or wood spirit, are required, and even then the solution thus produced is not reliable or perfect. If the alcoholic solution remains standing a short time, a portion of the color is precipitated from the same, and if said solution is used for dyeing, the color of the dyed fabric is many times not uniform, and liable to come off. By the use of my compound all these disadvantages are avoided, it dissolves perfectly; the coloring matter is not liable to precipitate from the solution, however long said solution may remain standing, and wool, silk, cotton, also paper, and different other materials or fabrics can be dyed or printed therewith with the greatest ease and perfection.

"I am well aware that products soluble in water have been prepared by treating aniline colors with sulphuric acid, but such products are applicable more particularly for dyeing and printing leather or silk, but little or not at all for dyeing and printing of wool or cotton or fabrics made therefrom. I am also aware that some time ago, glycerin or decoctions of plants have been recommended for the purpose of dissolving aniline colors. But the extensive and common use of alcohol as a solvent of these colors, shows that said materials did not produce the desired result. I have never succeeded in producing, with these last-named materials alone, anything like a satisfactory result, and it is only possible to effect the solution, if at the same time a substance is used, such as glue, or equivalent material, as above specified.

"Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is: A compound, which is soluble in water, and made from such aniline colors which in themselves are not soluble in water, by treating said colors with glue or equivalent substances, either alone or mixed together, and with a liquid, such as acetic acid, or glycerin, or their equivalents, either alone or mixed together, as herein set forth."

Protection of the Eyes of Metal Workers.

Dr. Hermann Cohn, of Breslau, an oculist of some standing in the medical world, who is particularly well known by his examination of the eyes of 10,000 school children, has recently occupied himself with statistically ascertainlng the effect which the occupation of metal workers has upon their eyes. The results he obtained by examining 1,283 factory workmen of Breslau, are of the utmost interest for both masters and men in this branch of industry, and are worthy of a short abstract from the original paper, published in a medical journal, the *Berliner Klinische Wochenschrift*. Although his range of observation was necessarily very limited, inferences on other similar branches are easily made.

Dr. Cohn examined the workmen of six engineering establishments, whom he thus classifies:—599 fitters, 386 blacksmiths, 129 turners, 35 drillers, 13 planers, 27 enginewrights, 5 screwers, 15 boilermakers, 69 foundrymen, 8 cleaners of castings—altogether, 1,283. He did not include any laborers in his examinations, because their occupation is too shifting, and therefore he confined himself to mechanics with a constant occupation of the same character. About 90 per cent of these men declared that their eyes had often been struck by small chips of iron, turnings, borings, or filings, which had been removed by some of their fellow-workmen. In every workshop there is a man or two who have acquired by long practice a remarkable proficiency in removing foreign bodies from the cornea. All those minor accidents were excluded by Dr. Cohn, and the following figures refer only to such accidents of the eyes as required medical aid, and caused for the most part an interruption of work. Of the 1,283 workmen examined there had been 633—that is, 49 per cent—under medical treatment for accidents caused to their eyes by metal chips, etc., and this on an average twice over, the number of accidents to the eyes being 1,231—that is, 96 per cent of 1,283. The cleaners of castings seem to be most exposed to such accidents—87 per cent; then come the enginewrights, 83 per cent; turners, 69 per cent; drillers, 54 per cent; boilermakers, 53 per cent; fitters, 49 per cent; planers, 46 per cent; blacksmiths, 44 per cent; foundrymen, 26 per cent; screwers, 20 per cent. Out of the 633 wounded men, 354 were soon relieved by medical treatment; but 279 required more or less time before their eyes were cured, and they consequently had to stay from work all this time. The whole time lost in this way amounted to 4,726 working days—that is, on an average, 17 days for each wounded man. The eye wounds of drillers, cleaners of castings, and turners, were soonest healed (four to ten days); next come planers, screwers, enginewrights, fitters, and blacksmiths; foundrymen and boilmakers seem to be exposed to the most dangerous eye wounds, requiring from 40 to 47 days for curing. Out of the 1,231 eye wounds, 1,172 were completely cured, 38=3 per cent, were not completely, and 21=2 per cent, not at all cured. This means that of 1,000 metal workers, 28 lose part of their seeing power, and 16 the whole use of one eye in consequence of their occupation.

It would not be much to the purpose in this place to follow Dr. Cohn in the medical detail of the different wounds, and their effect on the eye; only so much may be mentioned that the wounds of blacksmiths and fitters are, as a rule, of a much more dangerous character than those of other men, and that they also lose one of their eyes much oftener. This is no matter of surprise, since their eyes are mostly hurt by red hot metal. Now the question arises, Cannot this danger to the eyes of metal workers be avoided by their using protecting speclacles? Of the men examined by Dr. Cohn, only 21 used blue conservation spectacles, in consequence of previously received wounds; and 31 used ordinary convex glasses, owing to their being far-sighted. Not one used protecting glasses. When asked why they did not take more care of the most noble organ of their body, the men always replied, "Spectacles are too easily broken." "They are too heavy and they are too dear." These objections are unquestionably valid, and caused Dr. Cohn to consider what other preventive means might be resorted to against those two frequent accidents to the eyes of metal workers. There happens to be a manufactory of objects of mica, uch as lamp chimneys, etc., at Breslau, where Dr. Cohn resides, and thus mica suggested itself to him for his purpose. He caused Mr. Raphael, the proprietor of the just mentioned establishment, to try experiments with manufacturing protecting spectacles from mica, and those experiments were crowned with perfect success. They seem to have completely solved the above named difficulties.

The mica spectacle glasses are curved somewhat in the shape of watch glasses; they not only protect the eye in front, but their brass frames fit closely on the osseous circle round the eye sockets, so that no chips can enter the eye from any part, and still the eyelashes do not touch the glasses. The frame is made of thin brass wire, which can easily be bent by hand into any shape. As hinge joints would have caused too much expense, the side parts are soldered on to the frame. The thickness of the mica is about one-twenty-fifth of an inch. Only the purest kind of mica being used for this purpose, these spectacles are just as transparent as real glass ones. They impart, to be sure, a slight pale grey tint to the objects, but they do not in the least weaken the optic nerve of the eye. For blacksmiths and foundrymen such a grey tint is rather an improvement, and for other metal workers it is not in the least objectionable. Now these mica spectacles, besides protecting the whole eye, have the following advantages: First, they cannot be broken; heavy blows with a sledge-hammer only squeeze them flat, without breaking the glasses. They may be thrown to the ground with full force without being damaged in the least. Red hot metal poured on the mica does not make any impression on it. The shower of pointed particles of iron which issues from lathes, etc., only rebounds from the perfectly elastic mica glasses. Secondly, mica spectacles are almost twice as light as glass spectacles; a pair of French watch glass shaped spectacles weighs 13·9 grammes; mica spectacles only 7·5 grammes. Thirdly, mica spectacles keep the eyes of the workmen cool, mica being a very bad conductor of heat. Fourthly, mica spectacles are very much cheaper than glass spectacles, especially watch glass spectacles, which are the only ones that protect the whole eye. The mica spectacles are sold at Breslau for for about eightpence, English money, a piece. They would be, of course, a few pence dearer in this country, as carriage, duty, commission, etc., would add to the expense. But, at all events, their cost would be exceedingly trifling when compared with the very serious expense, loss of time, and pain that are caused to iron workers by the frequent accidents to their eyes. No doubt, Mr. Raphael will soon establish an agency for the sale of mica spectacles in this country, and we shall then hear more about them. As it is, we strongly recommend our metal workers to look into so important a matter.—*Mechanics' Magazine.*

MANUFACTURING MINING, AND RAILROAD ITEMS.

The State of Michigan possesses several very important coal mines, the products of which are well suited for use in machine shops, on railways, steamboats, or for domestic purposes. Last year 9,000 tuns were turned out from one mine, representing an aggregate value of about $31,500. The whole production of the State for 1867 was about 25,000 tuns, representing a value of $97,000, and as the business seems destined to rapidly increase, it can justly be regarded as one of the most promising sources of Michigan wealth.

The Pacific railroad company's bridge across the Missouri river at Omaha is to be one of the most substantial and expensive structures in this country. The bottom cord will be fifty-five feet above high water mark, thus avoiding the necessity of a draw. The truss is to be constructed of iron, supported by substantial stone abutments and piers. The estimated cost is $2,500,000, and its completion, it is thought, will require two years.

There is a serious quarrel between the Atlantic and Great Western railroads, and a combination of all the railroads companies running East out of St. Louis. It has been customary at all the offices of the railroad companies starting directly from that city, to sell the through traveler tickets for any connecting route he chooses to take beyond these lines. The A. & G. W. road is a broad gage, connecting with the Erie. Its business relation with St. Louis is so large as, in the opinion of its managers, to justify the opening of a separate office in that city. This step caused the other roads to refuse to sell through tickets by that route, but the manager of the A. & G. W. road, forseeing this, and having bought up a large number of tickets, retaliated by reducing the through fare to New York from $36 to $28. Meanwhile, with this and the late Erie reduction, the traveling public are reaping the benefit of the wars.

The same company that work the famous California borax lake, own also sulphur bank near it, estimated to contain 20,000 tuns of this material, from which they extract from six to ten tuns of sulphur per day. Some portions of the deposit are unusually pure, containing not over 10 or 15 per cent of foreign matter. The demand for the article in the State of California alone, amounts to 1,200 tuns annually, the chemical works taking 500 tuns, the powder mills calling for 600 tuns, the watch factories and miscellaneous works absorbing the balance.

Rich deposits of copper ore have been discovered in Polk county, one of the most mountainous sections of East Tennessee. Where the boundary lines of Tennessee, Georgia, North Carolina and South Carolina approach each other, there the spiral back-rocks of several ranges of mountains and high ridges seem also to converge, and this vicinity is rationally supposed to comprise a great metallic field, of which the copper mines opened at Ducktown are but the outcropping. The mines, as far as opened, are scattered over a plateau of five or six miles extent, and elevated 1,500 feet above the sea. One of these mines yielded over one million pounds of refined copper last year.

The Pacific Mills, of Lawrence, Mass., were the fortunate recipients of the prize of $2,000 in gold, awarded at the late Exposition for its success in securing harmony between employers and employed and in advancing the welfare of the operatives. The Exposition gave ten awards for superiority in this respect, and among five hundred competitors, nine were bestowed upon establishments from continental European countries, none from Great Britain and this one from the United States.

A large and enthusiastic meeting of the business men and capitalists of Cleveland, Ohio, was held last week, to take action concerning the building of a broad gage railroad through Cleveland to Sandusky, Toledo, and the West. Resolutions were adopted pledging the sympathy and capital of the city to aid the enterprise, and a committee was appointed to raise funds.

At Mosey Creek, on the East Tennessee and Virginia railroad, thirty miles from Knoxville, a New York company, at an outlay of $200,000, have just completed their extensive zinc works of twenty-four furnaces. The ore is found on the spot, and is manufactured into the oxide or "flour" of zinc, from which zinc paint is made. Eight furnaces already in operation turn out one hundred barrels per day.

A St. Louis telegram asserts that experiments have been carried on for the past few montes in reducing Iron Mountain ore to pig metal, with what i known as Big Muddycoal. The final trial, just completed at Carondolet, six miles below that city, has shown that the coal contains less sulphur than any other known, and metal can be made from it at less than twenty dollars per ton.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Valve Gear for Steam Engines.—S. S. Jamison, Jr., Salisbury, Pa.—In this invention the valve gear is worked directly by the crosshead, the engine being thereby greatly simplified, and the power that operates the valves being more economically applied, than in any other engine.

Lubricator.—Erastus Johnson, Wilkins, Pa.—In this invention the body of the oil cup is made of metal, its ends being of glass. The screw plug that regulates the flow of the oil is operated in a novel manner, and a new method of packing the oil cup, so as to render it air-tight, is adopted.

Oyster Rake.—Asa Barrett, Baltimore, Md.—This invention is a simple and and easily operated device by which oysters can be fished up from great depths.

Self-Acting Door.—G. M. McMahan, Mt. Sterling, Ky.—This invention is a door for houses, so constructed and operating that, while at other times it remains closed, it will automatically open upon the approach of any pers who desires to pass through.

PLOW.—B. W. Sutherlen, Freesoil, Minn.—The object of this invention is to enable the plowman to ride, and at the same time hold and manage his plow n any soil as perfectly as by the old method of holding it, and with the outlay of but a small part of the labor and strength required by the old method.

SHINGLE MACHINE.—H. G. McDuffee, Bradford, Vt.—The subject of this invention is the machine for planing shingles, clapboards, etc., in which an endless apron carrier is used. This invention consists in employing a series of beds on the surface of the carrier, which hold, guide, and govern the shaping and bevel of the shingles or clapboards, as they pass under the planer.

CAR COUPLING.—David V. B. Smart, Troy, N. Y.—This invention relates to a new method of constructing couplings for securing railroad cars together, whereby the self-acting coupling is greatly simplified, while its effectiveness and durability is equal to any in use.

PIPE CUTTER.—John De Galleford, Cohoes, N. Y.—This invention relates to a pipe cutter which is so arranged that although the cutter is held with great power against the rule or pipe to be cut, the support of the pipe in the device will still yield to eccentric projections on the face of the pipe, or to inequalities in the pipe, so that no undue strain will be occasioned by such projecting portions or inequalities, without which scarcely any ordinary pipe or rule is ever made.

BUTTONHOLE LINING FOR CARRIAGE CURTAINS.—John Barclay, Attleborough, Mass.—This invention relates to the manner of lining buttonholes for carriage curtains, and has for its object to strengthen the edge and to facilitate the fastening and unfastening from the knob, as well as to prevent the spontaneous release of the curtain from the knob.

DETACHABLE BALL JOINT.—Henry Brevoort, Brooklyn, N. Y.—This invention relates to a device for securing the ends of straps, cords, chains, or other articles to some stationary or other device, in such a manner that the attachment may be perfectly secure and may still be easily disengaged whenever desired.

SPECIFIC FOR SCARLET FEVER AND DIPHTHERIA.—S. P. Sedgwick, Wheaton, Ill.—This is a specific for the cure of the above diseases.

PRINTING HATS ON BLOCKS.—Alfred Barnes, Newark, N. J.—This invention relates to a new manner of printing hat bodies with suitable designs, and consists in printing the same while they are yet upon the blocks or cones after pouncing.

ATMOSPHERIC CHURN.—D. C. Hall, Hannibal, Mo.—This invention has for its object to furnish an improved atmospheric churn, simple in construction, easily operated, and which shall be so constructed that warm or cold air may be forced into the churn to bring and keep the contents of said churn at the proper temperature.

SHINGLE AND HEADING MACHINE.—James E. Austin, Oswego, N. Y.—In this invention a new apparatus is provided for heading and pointing the shingles, and it is so constructed that by throwing a portion of it out of gear the stuff can be sawed into thin boards of a uniform thickness suitable for barrel heading.

MACHINE FOR TURNING OFF LOCOMOTIVE CRANK PINS IN THE WHEEL.—W. Blythe and N. Hayes, Alexandria, Va.—The object of this invention is to obtain a cheap, portable device by the use of which the crank pins of locomotive wheels can be easily turned off without removing them from the wheel.

CYLINDER FOR HANDLING LEATHER.—J. W. Lull, Glen Hope, Pa.—The object of this invention is to facilitate the handling of leather during the process of manufacture in tanneries,

SPOKE MACHINE.—Geo. W. Felts, Carbondale, Ill.—In this machine the spokes are placed in a movable frame and held against the knives. The latter are attached to revolving wheels borne backward and forward by a carriage worked with a screw.

DRAIN PLOW.—John Masters, Waukegan, Ill.—This invention combines with a new form of plow a new device for adjusting it and a new arrangement of the wheel by which the working of the elevator is improved.

JIG SAW.—Bernard Demming, Cleveland, Ohio.—In this invention a new device is adopted for adjusting the saw at any inclination, to either side, for the purpose of bevel sawing, and another for regulating and adjusting the rake of the saw.

CAR REPLACER.—Samuel S. Jamison, Jr., Salisbury, Pa.—The object of this nvention is to provide a device which can be conveniently carried at all times on the train, and which will enable the engine or cars to be readily replaced on the track when thrown off. It is so constructed that its several parts can be placed in position for use on either side of the rails and in whatever direction the train may be moving.

CHILDRENS' HIGH CHAIR.—John Nichols, Gardner, Mass.—This invention has for its object to so improve the construction of childrens' high chairs that they may be arranged as high chairs for the children to sit at the table, for play chairs having tables in front of the chairs to receive the playthings, or simply as low chairs, and which shall at the same time be easily and quickly adjusted for use in either form.

NUTMEG GRATER.—John G. Roth, New York city.—This invention has for its object to furnish a neat, simple, and effective nutmeg grater which will do its work quickly and well, using up all the nutmeg.

IRONING BOARD.—George J. Birch, New York city.—The object of this invention is to provide an ironing board which may be conveniently used and which may be folded together into smaller compass when not required for ironing or pressing clothes.

HAND CORN PLANTER.—Daniel Broy, Springfield, Ill.—This invention has for its object to furnish an improved corn planter so constructed and arranged that the seed may be divided or scattered when dropped, and which shall at the same time be simple in construction and convenient and effective in operation.

SWING SHEEP FEEDER.—Amos Putnam, Vernon, Wis.—This invention has for its object to furnish a means by which sheep may be fed quicker and with less annoyance than is possible where the feeding is done in the ordinary manner and with the ordinary means.

PLANING MACHINE.—O. P. Furman, Addison, N. Y.—This invention has for its object to furnish an improved machine by means of which the plane surfaces of turned work may be accurately and conveniently planed whether said plane parts be square or polygonal in their cross section.

PROPELLING VEHICLES.—Thomas Rhoads, Fiskilwa, Ill.—This invention relates to the propelling of vehicles for practical use and consists of the spring and wheel work mechanism attached thereto.

ICE PITCHER.—Robert Holmes, Middletown, Conn.—This invention is designed to obviate the difficulty attending the lack of a proper support for the inner wall of the pitcher. This inner wall requires to be very firmly secured in position and its bottom thoroughly well supported, as the latter is liable to be forced off or the soldered seam or joint, by which it is connected to the side, ruptured by dropping heavy pieces of ice into the pitcher. Beside this contingency, the inner wall, when the pitcher is filled with water containing ice, is very liable to give laterally when the pitcher is tilted to pour water from it, and the soldered seam or joint by which the upper end of the inner joint is connected to the external wall, frequently breaks or becomes ruptured under the weight. This invention fully obviates these difficulties, and to this end it consists in leaving the bottom or base of the pitcher which is attached to the external wall, detachable, and connected to said wall by a screw joint so that it may be very readily detached whenever necessary, said bottom being provided at the center of its upper side with a step or projection to receive a pendent pin at the center of the bottom of the inner wall. By this arrangement the inner wall is firmly supported both laterally and vertically so that the bottom of the same cannot be forced out nor the upper joint or seam ruptured.

APPARATUS FOR BREWING, MALTING, DISTILLING, AND DRYING.—Andrew Barclay Walker, Warrington, England.—This improvement has for its object the facilitating of the process of brewing and distilling by attemperating the atmosphere in the gyle tun rooms, or the atmosphere immediately surrounding the gyle tuns, or attemperating the vats by a direct application of the air to the same to that degree of temperature in summer or winter by which the process of vinous fermentation may be most successfully conducted, never allowing the temperature to rise above or fall below that degree of temperature, during which the azotic constituents of the worts become most speedily oxydized by the oxygen of the atmosphere, and further, the maintenance of that degree of suitability or uniformity of temperature throughout the process of fermentation.

WEATHER STRIP.—James R. Mills, Macon City, Ala.—The object of this invention is to prevent the weather, or, in other words, the wind and rain and snow from being driven under doors into dwellings.

COMBINED HIGH AND LOW PRESSURE ENGINE.—Thomas L. Jones, Natchez, Miss.—In this invention the engine is so constructed that when the pressure of the steam in the exhaust end of the cylinder is more than 15 lbs. to the square inch, or more than balances that of the atmosphere, the steam exhausts into the open air; but when the pressure falls below that of the atmosphere, the steam exhausts into the condenser; thus causing the engine to act, during a part of the stroke, on the non-condensing, and during the remainder on the condensing principle.

ROTARY ENGINE.—Samuel S. Jamison, Jr., Salisbury, Pa.—This invention relates to that class of rotary engines in which the steam is applied to a revolving cylinder, one side of which works against an abutment, and consists in so constructing the cylinder and the abutment that the engine is greatly simplified, and the cost of it reduced, while the power of the steam is utilized to great advantage, and the parts of the engine can be readily adjusted and made tight, should they at any time work loose.

MACHINE FOR TENONING SPOKES.—James L. Parker, Harrisonburg, Va.—This invention is an improvement in the construction of tools for cutting spoke tenons by machinery, whereby the instrument is simplified and rendered more effective in operation than those hitherto in use.

CORN PLANTER AND PLOW.—T. H. Frampton, Hopewell, Ohio.—In this invention a seed box and distributing arrangement are attached to and used in connection with a common plow, the distribution of the seed being regulated in a novel and very convenient manner, by hand. A new device is also employed for adjusting the pitch of the two rear teeth.

DEVICE FOR LIFTING HOT DISHES.—S. J. Talbott, Milford, N. H.—This invention relates to a device for lifting hot dishes from a stove, oven or warmer, so that they may be placed upon a table or tray with the greatest facility, and without danger of burning the hands or fingers.

STOVE.—Harvey Brown, Harlem, New York city.—This invention relates to an improvement in the construction of stoves, such as are designed for the operations of cooking, washing, and other purposes connected with housekeeping. Its object is to construct a stove in such a manner that it may be readily taken apart and adjusted together, be portable, like an ordinary open furnace, and also be capable of being used as an ordinary fixed stove.

COOK FORK.—Hiram Smith, Des Monies, Iowa.—This invention relates to an improvement in cook forks, and consists in a novel attachment for the same, whereby articles of food taken up from a dish or any culinary vessel, may be shoved off from the tines of the fork without the application of the thumb or fingers thereto, or without scraping them off at the side of a dish.

WATCH PROTECTOR.—Carl Baumann, Poughkeepsie, N. Y.—This invention relates to a watch protector, composed of a C-shaped plate fastened in the vest pocket, and of a wire ring fastened to the lower part of the plate. The watch is held between the ring and plate, and can only be extracted by drawing the upper part of the ring away from the plate, which can only be done effectually by hand, and if the watch is pulled without drawing the ring and plate apart, as aforesaid, it can never be removed. A hook is formed at the lower end of the plate to serve as a support for the watch, and to prevent the removal of the same from underneath.

BOLT AND RIVET TRIMMER.—Aaron B. White, Meriden, Mich.—This invention relates to an improvement in a machine for cutting or trimming bolts and rivets, an operation which has usually been performed with hammer and cold chisel.

TRACE CLIP.—Peter Schoonmaker, New Britain, Conn.—This invention relates a new device for securing the hold-back ring to the hames, and consists in securing the said ring to the trace clip, and not directly to the hames, as heretofore generally done.

HARNESS ATTACHMENT.—George M. Zell, Waynesville, Ohio.—The object of this invention is to dispense with the use of the ordinary tugs or traces to harnesses, and by the improved attachment embraced herein it is satisfactorily accomplished, and in such a manner as to enable a horse to be attached and detached from the shafts of the vehicle with the utmost dispatch and ease, it requiring but the buckling and unbuckling of one buckle.

FIRE GRATE.—W. D. Guseman, Morgantown, West Va.—This invention relates to an improvement in fire grates, for which Letters Patent were granted June 15th, 1863. The present invention consists in providing the grate with a projecting part, which is some distance above the grate and projects over or beyond the front of the same, so as to catch all dust which may emanate from the grate, and cause it to enter the flue, said projecting flue also increasing the draft of the grate. It also consists in combining with the projecting front aforesaid a sliding blower or screen.

COMPOSITION FOR ROOFING.—Henry W. Johns, New York city.—This invention consists in compounding the fibrous mineral known as asbestos with pigments oil, coal tar, mineral pitch or asphaltum, wood, tar, resin, varnish, and the like, or kindred compounds of any of these, with other minerals, as ground slate, marble dust, sand, clay, lime, and the like, with asbestos, whereby a coating for roofing and other purposes is obtained, which is water proof, fire proof, and otherwise indestructible by the elements. Other analagous compounds for roof cements and plastic preparations for which asbestos is the chief ingredient are provided by this invention. A cement of proper consistency to be applied with a trowel for joints and fissures in stone, metals, and wood, and for repairing leaks in roofs, may be made of the same ingredients.

COTTON OR HAY PRESS.—J. Wentz, Girard, Ala.—This invention consists in applying the mechanical expedient familiarly known as a toggle joint for the purpose of pressing cotton, hay, or other like substance, into a bale.

UPSETTING MACHINE.—J. F. Sargent, Tunbridge, Vt.—This invention relates to the compressing or upsetting so called, of iron tires, bands, bars, rods, or other metallic bodies of longitudinal dimensions. It consists of a pair of bearers, operated by an oscillating disk, to which they are connected by links, the said levers having projecting arms which, when operated bear down upon the iron bar or rod with the peculiar upsetting motion.

HORSE HAY FORK.—S. M. Hoagland, Franklin, Pa.—This invention relates to those forks which consist of two pivoted tines, and which are used to load or unload hay by means of a horse.

DRAFT ATTACHMENT TO CHIMNEY.—H. J. Weed, Cazenovia, N. Y.—This invention relates to a new manner of arranging metal chimney caps, so that the draft will be facilitated by wind, and so that the free discharge of products of combustion is not obstructed.

CAPS FOR OIL CANS AND OTHER VESSELS.—Josiah H. Noyes, Center Abington, Mass.—This invention consists in the combination of a revolving cap or cover, with the neck and mouth of the can or vessel; the construction of my improvement being such that when the cap is revolved in one direction the can or vessel will be opened, and when the cap is turned in the contrary direction, the can or vessel will be closed.

LAMP BURNER.—J. Homer Smith, Brewster Station, N. Y.—This invention relates to a lamp burner, which is so arranged that its flame cannot pass through the wick tube into the oil reservoir, even if the wick should not fit close within the tube. It consists in arranging two feeding cylinders opposite each other, and on opposite sides of the tube.

GAS LIGHT REFLECTOR.—Wm. J. McLea, Buffalo, N. Y.—This invention relates to an improvement in the construction of gas light reflectors, and consists in connecting ordinary reflectors with an apparatus of jointed and sliding rods and pliant gas tubes, in such a manner that the reflectors may be moved in their position.

GATE.—E. M. Naramore, North Underhill, Vt.—This invention relates to a new and useful improvement in constructing and operating gates for fences and house yards, and similar purposes.

ADJUSTABLE SCROLL INDEX FOR GEAR-CUTTING MACHINERY.—W. M. Galusha, Arlington, Vt.—This invention relates to an index for gear engines, and for engine lathes, on which gears are cut, and its object is to produce a cheap, simple, and durable index, which can be easily understood and managed. It consists in the use of a disk, in the face of which a spiral groove is cut, in which groove one or more perforated plates are arranged, so that they can be moved freely in the grooves.

MACHINE FOR SMOOTHING LOOKING-GLASS FRAMES AND OTHER UTENSILS WITH SAND PAPER.—G. F. Hammer, Cincinnati, Ohio.—This invention relates to improvements in the construction of a machine for rubbing and smoothing the surface of looking glass and picture frames.

RAILS FOR RING SPINNING.—Cyrus B. Morse, Rhinebeck, N. Y.—This invention relates to an improvement in the construction of rails for ring spinning and their connected machines.

BROOM HEAD.—Albert Alden, East Cambridge, Mass.—This invention consists in a new manner of securing the corn to the head, and in the construction and arrangement of the different parts which constitute the head. The stub ends of the broom corn or brush are laid over a wooden or other bar, so as to be held between the same and the cross bar of the broom head, to which the handle is secured. The said bar is secured to the cross head by means of screw bolts and the sides or the corn are confined between side springs or leather or elastic bands. The two halves of the broom on both sides of the aforesaid bar are connected by a thread, wire, or cord, which is passed through holes or slots in the bar.

Business and Personal.

The charge for insertion under this head is one dollar a Line.

Patent Office Reports for sale at low prices. Also, an entire set of Agricultural Reports. Address Samuel C. Jones, Box 773 Postoffice New York city.

Foreman or master mechanic, machine shop or rolling mill. Reliable. Address M. M., Syracuse, N. Y.

Merriman's patent bolt cutters—best in use. Address, for circulars, etc., H. B. Brown & Co., New Haven, Conn.

Bartlett's machine and needle depot, 569 Broadway, New York. Needles for all machines. Hackle, Gill Pins, etc.

Engineering facts and figures for 1867, mailed on receipt of $3. John Penington & Son, 127 S. 7th st., Philadelphia, Pa.

Entire, State, or shop rights for three new first-class toys for sale. Send 50c. for samples to J. Pusey, 700 Spring-Garden st., Philadelphia

Waterwheel governors, first-class line shafting and pulleys Address Greenleaf & Co., Indianapolis, Ind.

30,000 lbs. hard waste paper stock for sale. Address H. G. Hall, Fayetteville, N. C.

Newton's patent animal tedder is the best in the world. Warranted to give satisfaction or the money refunded. Agents wanted all over the Union. Send for circular. Address D. Newton, Southington, Ct

6x12 Woodbury engine, nearly new, $450 on cars. Wanted address of rope and paper manufacturers. A. Logan, Tideoute, Pa.

Manufacturers of the patent adding apparatus send wholesale price list to Richmond & Hoster, Seneca Falls, N. Y.

Manufacturers of builders' hardware will please send their address to Geo. J. Colby, Waterbury, Vt.

What machine is required to clean the outer hull of the castor oil seed? (not the covering or shell of the kernel,) and what is the cost of such a machine? Address E. Parker, M.D., Abbeville, S. C.

Lead pipe and sheet lead—for a superior article address Pittsburgh Lead Pipe and Sheet Lead Works, Pittsburgh, Pa., No. 167 Smithfield st.

Patent can openers for 60 cents each, or $3 25 per doz. Address J. P. Kern, Oil City, Pa.

Whew! how many revolutions?—one—my cork extractor is making all over the country! Sent for 60 cents, postpaid. State rights for sale. Address W. G. Waterman, Middletown, Conn.

Brick Machine.—Lafler's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Lafler & Co., Albion, Orleans county, N. Y.

For Cotton and Woolen Machinery—Roll-carding Machines, Ring and Traveller Spinning Frames, etc., address Union Iron Works Rhinebeck, N. Y.

There are now in actual operation eight thousand of Ashcroft's Low-Water Detectors. John Ashcroft, 50 John st., New York.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Parties wishing to Manufacture the Hollen Knitting Machine on royalty, or who would supply a Company with machines, address Todd & Duncan, Bellefonte, Pa.

To insure the safety of your steam boilers, property, and life, apply Ashcroft's Low-water detector. John Ashcroft, 50 John st., N. Y.

For Improved Lathe Dogs and Machinists' Clamps, address, for Circular, C. W. Le Count, South Norwalk, Conn.

Black Gypsum—where can it be found in quantities so as to be worked? Parties that can furnish the article address E. E. Hendrick, Carbondale, Pa.

Paper Makers, Tanners, etc., wanting the Best and Cheapest Pump in use will send for Circular to Heald, Sisco & Co., at Baldwinsville N. Y. Agents wanted.

Incrustations removed without injury or foaming, by Winans' boiler powder, (11 Wall st., N. Y.,) 12 years standard and reliable.

EXTENSION NOTICES.

Collins B. Brown, of Upper Alton, Ill., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in harvester rakes, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

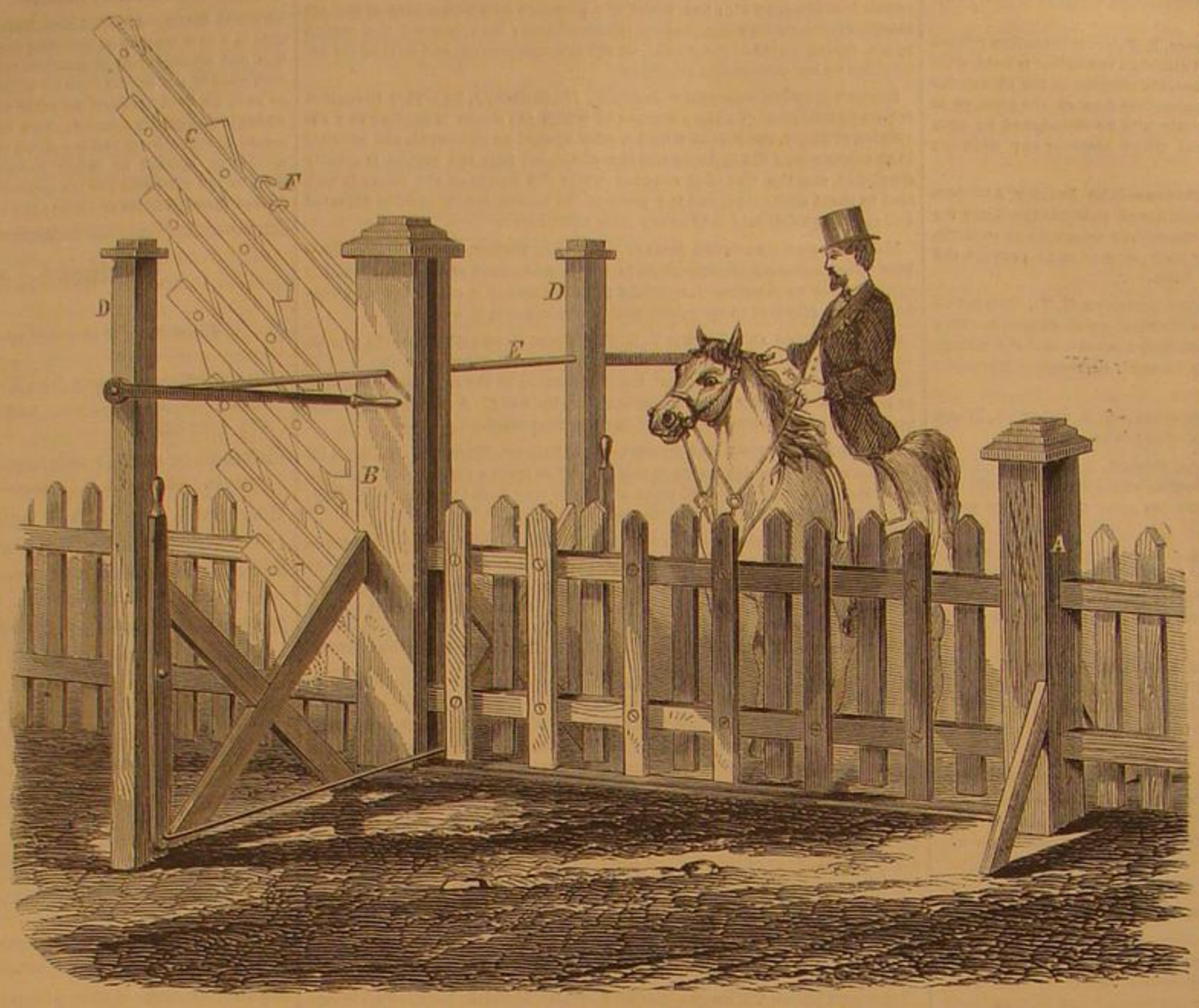
Hymen L. Lipman, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in eyelet machines, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Albert S. Southworth, of Boston, Mass., having petitioned for the extension of a patent granted to him the 10th day of April, 1855, and reissued the 25th day of September, 1860, for an improvement in plate holder for cameras, for seven years from the expiration of said patent which takes place on the 10th day of April, 1869, it is ordered that the said petition be heard at the Patent Office on Monday the 24th day of August next.

Improvement in Automatic Gates.

The accompanying engraving presents a view of a gate intended for carriage ways and general use on the farm or elsewhere. Folding gates of various styles have largely superseded those supported by and swinging on hinges, as the latter are continually getting out of order on account of the weight being supported wholly by the hinges. The gate herewith illustrated appears to be well adapted to the purpose designed.

A and B are posts connected by a sill on which there is a rail. The post, B, is slotted or double, and is considerably higher than the gate, which consists of one or more horizontal bars to which are pivoted a series of vertical pickets, as seen. The inner ends of the bars are pivoted to an upright in the post, B, shown at C, outline sketch, and the outer end of each horizontal bar carries a small roller which traverses the track on the sill in the process of opening and closing the gate. There are two posts, D, in line with B, which support a horizontal shaft, E, to which the upright bar, C, of the gate is pivoted. At each end of this shaft are handles, projecting nearly horizontally when the gate is closed, which are intended for opening the gate from a carriage or from on horseback. To the shaft, E, in the center of the post, B, is secured a lever, F, which engages with a pin on the upright bar, C. When the levers, or handles attached to the shaft, E, are depressed, the gate is opened and elevated into the position shown by the outline; it will close by its own weight. When it is required to fasten the gate open it may be done by moving the upright levers pivoted to the posts, D. They are moved simultaneously, being connected at the bottom by a rod, and engage with the levers on E. Thus the gate may be opened and held in that position until the traveler has passed, when a movement of the upright lever will disengage the handles of the shaft, E, and allow the gate to close.



GIDLEY'S PATENT FOLDING GATE.

Patented through the Scientific American Patent Agency Dec. 24, 1867, by Robert Gidley, whom address for rights, etc., at Freedom Plains, Dutchess county, N. Y.

Improvement in Revolving Harrows.

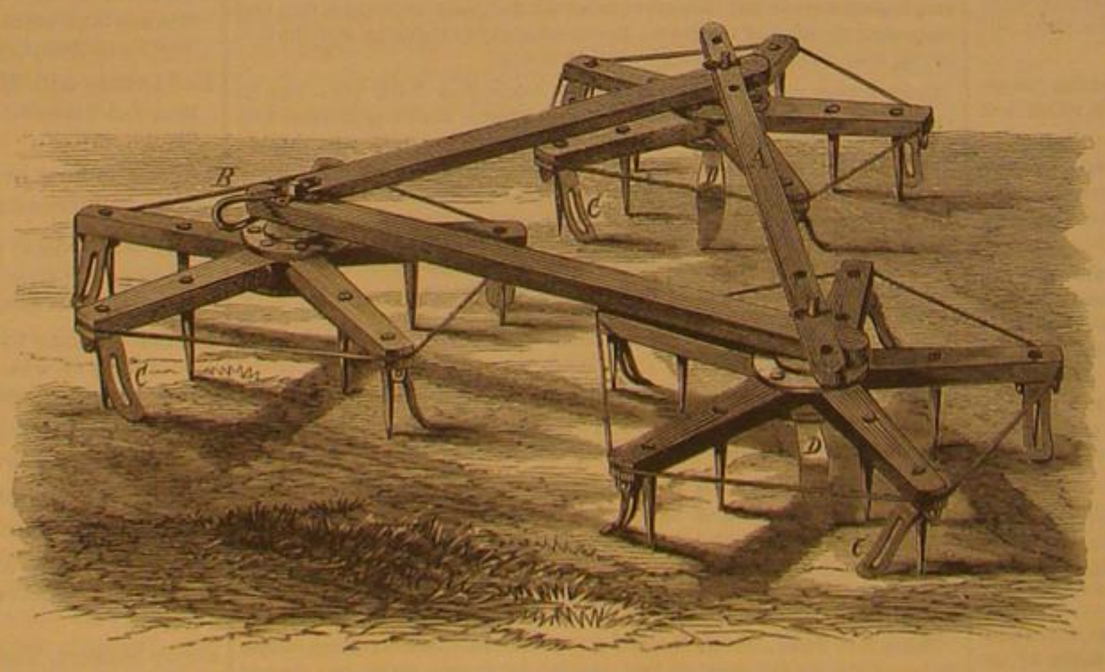
Pulverization of the soil and changes of the position of its particles are necessary to successful agriculture. The soil for growing plants should be loose and open for the accomodation of the small roots and for the admission of light and air. To this end, and to afford nutriment to plants, the particles of soil should be separated, clods and masses broken up and pulverized. This work is done with the harrow, but the ordinary drag harrow is a great absorber of power, and the revolving harrows which have, in some instances, taken its place, possess some objectionable features. The inventor of the harrow herewith illustrated believes that all the objections to revolving harrows are removed by his improvements.

The machine is triple, there being three revolvers connected by bars, the one marked A being an extension bar. The forward ends of the two others are connected by a simple clevis, B, to which the draft is attached. The arms of the revolvers are firmly secured in a double metallic hub, which carries the axle, and they are armed with two rows of teeth, an inner and an outer row. Attached to the arms, directly behind each outer tooth, is a scraper or paddle, C, which is hinged so as to swing freely out from the tooth, and when it comes back it is held vertically by the tooth. The inner teeth have no scrapers but revolve close to a colter, D, projecting from the center of the revolver.

In operation the paddles, being hung loosely on one side of the teeth, will, on one side of the revolvers, present themselves in front of the teeth, while on the other side they will offer no resistance to the passage of the teeth through the soil, as they will lie flat on the surface until they pass the line of draft, when they immediately plunge in and are held by the teeth vertically until they again pass the line of draft on the other side. The action of these spades, or paddles, is somewhat different from what the casual observer would suppose. While the revolvers, with their teeth and spades, are turning, they are, at the same time, being drawn through the soil. After passing the line of direct draft, the motion of each individual spade, in succession, diminishes to a stop at an angle of about forty-five degrees to the line of draft, and it remains inoperative until the axle has passed by, when, at about the same angle in the rear, it starts diagonally and edgewise forward, with a slight curve. Every tooth is kept clean from weeds, roots, etc, the outer ones by the slots in the spades, C, and the inner ones by passing the colter, D. The two rear revolvers turn outward in opposite directions so that all stones and roots are thrown to the outside and rear. By taking off the front revolver the machine becomes an excellent cultivator for corn, cotton, and other crops, taking two rows at a time. When the extension bar is spread it will harrow a width of eight feet.

In construction the harrow is very simple, having no parts to get loosened or lost, there being no nuts nor separate bolts. The under sides of the arms have iron straps let in for holding the teeth securely, which is further assured by a common wood screw passing through the flat heads of the teeth and being seated in the wood. The machine can be taken to pieces for ease of transportation and put together in a few minutes.

Patented through the Scientific American Patent Agency, March 26, 1867, by Caleb Bates, who may be addressed for rights or machines at Kingston, Mass.



BATES' PATENT, REVOLVING AUTOMATIC HARROW.

Odoriferous Constituents of Wine.

It is well known in perfumery that freshly distilled waters have not the pleasant smell, particularly when they are prepared from newly culled plants, which they acquire after a lapse of time. So it is with wine, which requires cellaring to obtain its "bouquet." Oenanthic ether, a fluid which was first examined by Liebig and Pelouze, is generally supposed to occasion the vinous odor, but we find on examination that it does not. The odor of this ether is something like wine which has been exposed to evaporation, and is far from being agreeable; it masks in young wines the fragrance of aromatic principles, which do not appear till the oenanthic ether has undergone decomposition.

Brandy, which is added to port wine, in the proportion of one twelfth, may at first be detected by its smell, but after lying three years, the smell will disappear.

The most odoriferous ingredients predominate in wines containing free acids—tartaric acid, for example. Very sweet wines, however, such as those of Turkey, Spain, and Italy, are much less fragrant than those of France and the Rhine. Among the many peculiar odoriferous principles whose existence has been ascertained in wine, we will only mention the most important: Acetic ether appears in most, if not in all aromatic wines, and is developed in them by time. The adulterators of wine are well acquainted with this fact, and know how to make use of it. Both butyric and caprylic ether, very volatile liquids, with the odor of pine-apples, have also been found in it. Caproic ether, which has the smell of melon and golden zeineth and acetate of capryl, are other singularly fragrant ingredients. The pelargonic ether, a fluid found in remarkable quantities in Irish whisky, and the capric ether, which is met with in the fusil oil of potatoes, are also present in the fermented juice of grapes. Acetal appears to be principally found in Hungarian wines.

Nothing, perhaps, will prove more strikingly the fallacy of the common text-book theory, that sugar only undergoes one process of fermentation, viz., that into alcohol and carbonic acid, than the presence of so many of the above ingredients. And we might add that not all vegetables which contain sugar, and ferment, will yield alcohol, since onions, though they are very saccharine, will yield entirely different products when fermented.

The simple fact that a few drops of wine, left in a bottle, will cause the latter to retain the vinous smell for weeks, is sufficient to show how very strong the odor of those principles must be, and still they do not appear in greater quantities than $\frac{1}{10000}$ by weight.

The bouquet of wine is much improved by the etherial oil, which is found in the grape blossoms, and is best imparted to the wine by collecting and drying them carefully, and putting a little packet filled with them in the must. This method was recommended by the celebrated Linnaeus, on the ground that the flavor of Smyrnian wines had been much improved by it.

Schubert evaporated wine till only one fifth of its original volume remained, and then confined it in a bottle, when at the end of five years, he found that it had a bouquet like wine of one hundred years of age. He therefore holds that the bouquet has nothing to do with the alcohol; but this view is certainly erroneous, since we detect many compounds of alcohol among the odoriferous constituents of wine.

Air Fermentation.

The patentee claims the mode of impelling air of proper temperature and moisture into the fermenting substance from below, for the purpose of more thoroughly fermenting the whole mass, and controling the progress of the fermention. He conceived this process with the view of a proper treatment of grape juice in California, but soon became aware that it would equally benefit any kind of fermentation. Should light wines prove less profitable than strong wines, the impelling of very dry air into the must will effect a partial concentration by evaporation of some water, and the time for ripening such qualities of wine—generally three to five years—reduced to a few months.

It is amply proved that air is a necessary agent to fermentation, and the method of impelling air has lately received high recommendation by an eminent German chemist and wine expert, Mr. Frings, in his reply to a consultory letter by the Commissioner of the Agricultural Department for the proper treatment of American wines. Mr. Frings expresses it as the only rational method of treating American wines to impart to them stability, purity of taste, and speedy ripeness.

That the process has similar advantages in the manufacture of superior beer, the quick and regular swelling of malt-corn, a more thorough conversion of all sacharine particles of the mash into alcohol, beneficial in fact to all fermentation is apparant. Patented August 6, 1867, by R. de Heureuse, San Francisco, Cal. C. W. Schumann, 42 Nassau street, New York city, is agent for the Atlantic States.

Lunar Vegetation.—A German astronomer, Prof. Schwabe has been closely examining certain dark lines which by the aid of the telescope may be seen extending across the slopes of the highest mountains in the moon. These streaks have been explained variously, some believing them to be the beds of dried-up streams, others, the channels left by torrents of lava. Prof. Schawbe claims to have discovered in these lines a greenish color which appears at certain seasons, lasts a few months, and disappears. He regards them as belts of vegetation.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York
☞ "The New York News Company," 8 Spruce street
☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents of the SCIENTIFIC AMERICAN.
☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XVIII., No. 18....[NEW SERIES.].. *Twenty-third Year.*

NEW YORK, SATURDAY, MAY 2, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Hydraulic Cow Milking Machine. 275
The Chemistry of Tobacco 275
Editorial Correspondence 274
Manufacture of French Leather. 275
The Watch—Its History and Manufacture 275
*Morse's Plan for Centering and Picking Bobbins 276
Embalming 276
*The Excelsior Grinder for Mowing and Reaping Machines..... 276
Science in a Toy 276
*Improved Copy Holder for Compositors 277
*Hilbert's Self-acting Lubricator.. 277
Spontaneous Generations..... 277
Process for Casting Steel under High Pressure 277
*Do We See the Sun as Soon as it Rises? 277
*Optical Illusions 277
Improved Compound of Aniline Colors..... 278
Protection of the Eyes of Metal Workers 278
Manufacturing, Mining, and Railroad Items..... 278
Recent American and Foreign Patents 278
Extension Notices 279
*Improvement in Automatic Gates 280
*Improvement in Revolving Harrows 280
Odoriferous Constituents of Wine 280
Air Fermentation..... 280
The Principle of the Giffard Injector..... 281
Is There Any Thing New Under the Sun? 281
Pacific Railroad Progress 281
A Remarkable Gas Well..... 281
History of the Watch..... 281
Manufacture of Enameled Cloth.. 281
Primeval Vegetable Life 281
Crystallization 281
Steam Pressure on the Side Valve 281
Patent Claims....282, 283, 284, 285, 286

THE PRINCIPLE OF THE GIFFARD INJECTOR.

Probably there is no mechanical device in common use which is such a puzzle to mechanics and others as the Giffard injector. Its operation seems to defy the best known laws of the equilibrium of fluids, yet it acts effectually, and under some circumstances is preferable to the pump for feeding boilers with water.

Its construction is simply a pipe fed from the steam space of the boiler to the water space, below the water level. The steam-leading pipe is contracted at its lower extremity, between the steam and water level, in a space which is filled with the feed water, a fine jet of steam acting against the feed water and forcing it into the reception pipe through a small aperture. Of course, necessary valves and cocks are employed.

A correspondent asks, what is the principle employed in the action of this injector? We cannot state it more clearly, so far as it is understood, than to give the opinion of Mr. John Robinson, of Manchester, Eng. He says: "The pressure on all parts of the interior of steam boilers being equal, some reason must be sought why steam taken from one part is able to overcome the resistance opposed to its entrance in another part of the same boiler. If a pipe conveying steam were turned directly back into the water of the same boiler, it is evident that equilibrium would ensue and no effect be produced. If, on the other hand, a break were made in the continuity of the pipe, so as to leave an interval open to the atmosphere, steam would rush from one pipe and water from the other in the boiler with a velocity proportioned to their different densities. In constructing the injector, the feed water chamber is placed at the break in the pipe, and this arrangement accounts for the power of the steam to overcome the resistance to its entrance into the receiving pipe of the boiler. The jet of steam, being concentrated on the water, forces its way through the interval surrounded by feed water, by contact with which it is gradually condensed, and reduced in volume and velocity, until it is entirely converted into water at the throat. In doing so, it imparts to the feed water a velocity proportioned to the pressure in the boiler and its own temperature; and, the water being non-elastic, it acquires sufficient momentum to overcome the resistance in the water space of the boiler."

In short, the action of the injector is simply mechanical. The same principle has been lately applied—somewhat modified—in attempts to use liquid petroleum as fuel for steam boilers. But, whatever may be the advantages of the injector under some circumstances, it is not always economical. It is a great convenience on locomotive and other engines where the boiler cannot be fed by ordinary devices except when the machinery is in motion, and it is inconvenient or impossible to have a "donkey" engine. The injector cannot work as hot water as the pump and the feeding must be very gradual, as the apertures of the pipes are very small.

IS THERE ANY THING NEW UNDER THE SUN?

A few days ago, being in the rooms of a scientific association in this city, our attention was directed to a book, the title page of which stated that it was published in Rome in 1685. It was a translation from a German work by Cornelius Meyer, and profusely illustrated with copperplate engravings. It was a heavy quarto, printed in large type, on coarse linen paper. Its title, "*L'Arte, Direstituire à Roma la Tralafciata Naugatione del fuo Tenere,*" showed that its subjects were mechanics and science. In it we found fascine bridges and causeways for military purposes, the piles on either side being driven by hand with a huge mallet, and fascines and earth being brought to fill the space between the piles. Other bridges, but with string pieces between the piles, are also illustrated. Then there are several illustrations of coffer dams of double rows of piles driven by a floating pile driver, filled in with clay, and with laborers inside removing the earth. Inclined planes for canals and rivers in passing boats around falls, and others for hauling logs from the water, to be sawed by a mill, with reciprocating upright saw driven by a breast water wheel are shown. Also diverting the currents of streams from washed shores by jetties built at an angle with the stream—a plan which we shall again speak of, as it has formed the subject of a paper in relation to the currents of the Mississippi, that we shall quote from hereafter.

This old book is quite a curiosity in its exhibitions of devices that are now subjects of patents. Evidently the inventions, or the principal ones, were never put to a practical test, but it is remarkable that most of them, not only in action but design, closely resemble the devices used for similar purposes in our day.

PACIFIC RAILROAD PROGRESS.

At the close of 1867, there were 650 of the 1,800 miles between Omaha and San Francisco spanned by the iron rail. By the close of 1868, we are promised 500 miles more, and by the 1st of July, 1870, the locomotive will make the entire distance between New York and the Golden City of the Pacific in about six days' time. No railroad enterprise was ever carried out with such dispatch before. When we consider that the two back-bone ranges of mountains are being crossed at elevations of 7,000 feet above sea-level, the magnitude and energy of the undertaking become more vivid. Both the powerful companies, who are building the line from opposite ends, are making commendable headway—the Central Pacific on the western half having 10,000 men at work, and the Union Pacific at this end having a force of 5,000.

The Pacific Railroad, therefore, may be set down as an assured, enduring success. There will be no lack of means or effort to finish it. The Government furnishes about half the cost of building, and private capital will do the rest. Already the line is paying more than its expenses on local traffic. What will it do when the through line is finished? By reference to the advertisement of the Central Pacific Railroad Company on the last page of this number, it will be seen that the six per cent gold bonds, based on a first mortage of the road, are offered for sale at their par value in currency.

A REMARKABLE GAS WELL.

Mr. F. Bowen, writing to us from Burning Springs, W. Va., gives the following description of a wonderful well, emitting gas at a high pressure. He says: "I will attempt to give you some idea of an immense gas vein here, which may be interesting to you and your readers. The well is 900 feet deep, four inch bore with a two inch pipe leading from it, more than a mile long, supplying 28 boilers of 12 horse power each, 50 stoves, and many lights, beside those which spring from leaks along the line, in consequence of the great pressure. I am now writing before a brilliant light on the counter, an engine of one horse power pumping water over the house, and the waste gas running two stoves. My gas is brought through one half and three quarters inch pipe and yet I am obliged to cut it off outside to produce the proper pressure. I believe the pressure is not less than 200 pounds to the square inch. The gas is nearly pure hydrogen with some carbon; it soon, however, mixes with the atmospheric air and thus becomes illuminating."

HISTORY OF THE WATCH.

We commence this week a series of articles on the construction of watches from the pen of H. F. Piaget, one of the oldest makers and repairers of watches in this city. The writer is the author of a book having the above title, which will be found advertised on another page.

Manufacture of Enameled Cloth.

The ordinary enameled cloth is prepared without the use of rubber among the ingredients, and, although heat may be used to some extent in some parts of its preparation, it is not vulcanized. This kind of enamelled cloth is very extensively used in covering furniture and cushions, for carriage curtains, and other similar purposes, but is liable to crack when exposed to cold, and is not reliable for wear as water proof.

The nature of this invention consists in adding a percentage of plastic rubber, or rubber prepared with any suitable solvent, as the ordinary rubber cement, to the ordinary ingredients used in preparing the enameled cloth, and enameling the same with the ordinary processes. The percentage of rubber should not be less than one sixteenth, and not more usually than one quarter, according to the purposes for which the cloth is to be used. This gives to the material additional tenacity and toughness, with additional pliability in all variation of temperature and under all ordinary wear. The usual ingredients used in preparing the ordinary cloth are litharge and boiled oil, the litharge being used in large quantities, to give weight and body to the coating. Processes have been devised for making a kind of waterproof or leather cloth, in which less than two per cent of rubber was used, but the main ingredient was resin or pitch, with a mixture of sulphur and lampblack. This, however, without the rubber, makes a coating differing materially from that upon the ordinary enameled cloth, and, with the rubber, makes a coating entirely different from this. A better preparation, however, and one more particularly used, is a mixture of boiled linseed oil, litharge, burnt umber, and plastic or dissolved rubber, each one part; but while these ingredients are used, these precise proportions may be varied according to the thickness and quality of the stock and material required. The coloring, final varnishing, and finishing, may be such as may be desired for use. Recently patented by E. M. Stevens, of Chelsea, Mass.

Primeval Vegetable Life.

The *Revue des Deux-Mondes* contains a curious article by M. G. de Saporta on vegetable life during the earliest ages of the world. The strange forms of antediluvian animals have been revealed to us in various ways; a fossil bone, nay, sometimes the mere print of a paw in hardened clay, have at times been sufficient to reconstruct the whole creature with tolerable approximation to truth, as subsequent discoveries have proved. The same method of investigation is now being carried on by those who are endeavoring to revive the flora which existed at a time when England, for instance, was peopled with kangaroos. A leaf, or the mere impression of one, found either in a lump of coal, or on a fragment of some hardened sediment, will at once tell the botanist to what genus of plants it is to be referred; and as observation discovers new facts, the species themselves, generally different from those of our days, are gradually distinguished and classified. It is thus we have at length reached a point from which we may pretty nearly guess what a primeval landscape looked like. Instead of the endless variety of form which lends such beauty to our plants and stately forest trees, we may picture to ourselves a uniform and gloomy prospect of dreary land, here and there interspersed with clusters of reeds, lepidodendrons, arborescent ferns, and similar straight and formal growths; but no soft grass, no daisies, or other wild flowers. Generally speaking, foggy heavy weather must have been the rule, and rains exceedingly frequent. This was during the Permian period; the Jurassic one was characterised by the prevalence of cycadeæ, a family of plants much resembling the palm, and peculiarly remarkable for their very slow growth. They are now chiefly to be found under the tropics. Our present vegetation seems to have made its first appearance during the subsequent, or cretaceous period. The development of the animal kingdom was evidently subordinate to that of the vegetable one; for beasts of prey could not live without herbivora, and these could not make their appearance until there was grass for them.

Crystallization.

A very curious discovery has recently been made by M. Auguste Bertsch, and turned to practical account by M. Kuhlmann, the celebrated chemist. Who is there that has not, during cold winters, stopped to admire the beautifully symmetrical and yet fantastic figures of leaves and flowers depicted on the window panes of a well-heated room, the air of which is charged with aqueous particles? M. Bertsch has found that Epsom salts (sulphate of magnesia) dissolved in beer, together with a small quantity of dextrine (artificial gum), and in this state applied to a pane of glass with a sponge or brush, will, on crystallizing, produce the identical designs above alluded to, hitherto considered peculiar to water; with this improvement, however, that the liquid may receive any color whatever, at the option of the operator. The ephemeral productions of frost may thus be easily perpetuated; but M. Kuhlmann, on being apprised of the fact, conceived the idea of going a step further, and transferring those fairy-like creations to stuffs and paper. For this purpose, he first got the crystallizations on sheets of iron, on which he afterward laid one of lead; by means of a powerful hydraulic press the minutest details of the figures in question were durably imprinted on the soft metal, and a copy of them in relief was then obtained by galvanoplastics. But here another difficulty arose; in the impression of cotton stuffs the pattern must be continuous; whereas in M. Kuhlmann's plates the lines at one end would clearly not coincide with those at the other, so that disagreeable interruptions would be caused in the printed designs. This obstacle, however, has been overcome in a most ingenious manner by effecting the crystallization on the cylindrical surface of a roller. A slight rotary motion imparted to it will prevent the liquid from accumulating at any particular point before it has evaporated.

Steam Pressure on the Slide Valve.

A correspondent, J. C. S., of Pa., writes as follows: "What amount of steam pressure is there on a slide valve in a steam chest of an engine, the valve being six inches long by five wide, the two steam ports four inches by one, and the exhaust port four inches by one and a half, with 80 pounds on steam gage? There are different opinions on this matter; some say the full 80 pounds pressure are on the thirty square inches contained in the face of the valve; others say the actual pressure is only on the number of square inches contained in the ports. I desire your opinion." The question of the pressure on the slide valve has been agitated for a long time. It is somewhat intricate. We will suppose the valve to be placed covering all the ports, with 80 pounds of steam per square inch on it. If the valve is tight it is plain that the pressure on it is thus: 30 square inches multiplied by 80 pounds, equal to 2,400 pounds, provided no steam gets underneath it. But, put the valve in motion, and the induction and eduction of steam takes place, of course giving a counteracting pressure under the valve, tending, in a degree, to resist the pressure on the top or steam side. Valves that are set so as to close the exhaust before the piston arrives at the termination of the stroke, of course compress the remaining vapor in the cylinder, thereby relieving the pressure on the steam side.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING APRIL 14, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
On application for Extension of Patent.....$50
On granting the Extension.....$50
On filing a Disclaimer.....$10
On filing application for Design (three and a half years).....$10
On filing application for Design (seven years).....$15
On filing application for Design (fourteen years).....$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $300 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,579.—Hose Coupling Wrench.—Albert F. Allen, Providence, R. I.

I claim the signal hose wrench, constructed substantially as herein described, with a socket, D, the spanning horns, B, and handle, H, for the purposes set forth.

76,580.—Steam Generator.—John F. Allen, Tremont, N.Y.

I claim, 1st, The arrangement of a number of chambers, A, of an oval or circular section, with circular forward end, and strengthened by braces or division plates, b, inclined upward, for the purpose described, in combination with hanging tubes or pipes, D, the whole being constructed in the manner and for the purpose substantially as set forth.

2d, The combination of the above-described chambers, A, with hanging pipes, D, water chamber, K, steam chamber, J, and connecting pipe, M, when constructed and arranged substantially as described and specified.

76,581.—Decarbonizing Iron.—J. F. Allen, Tremont, N.Y.

I claim, 1st, Purifying iron from its carbon and other impurities, by causing the molten iron, contained in a revolving cylinder, to pass in the shape of a shower or spray through atmospheric air or other oxygen-bearing gas or vapor passing or being forced through the revolving cylinder containing the iron, substantially in the manner as set forth and described.

2d, The construction of the revolving cylinder, A, with suitable lining, C, provided with holes or cavities, n, on the inner circumference, in the manner and for the purpose substantially as set forth and specified.

76,582.—Window Sash Stop.—Franklin Ball, Wilton Junction, Iowa.

I claim the combination of notches, H H, with the face plate and thumb piece, K, of a shait, D, and catch, A, of a window fastener, all substantially in the manner and for the purpose herein set forth.

76,583.—Floor Clamp.—George E. Banner, Newark, N. J.

Antedated April 7, 1868.

I claim the jaw, J, the sliding bar, L, and screws, K, in combination with the lever, D, ratchet, E, joint bar, C, main stem, B, with its foot, H, the whole being constructed and arranged to operate substantially in the manner and for the purposes specified.

76,584.—Vise.—Charles Barnes, Cincinnati, Ohio.

I claim, 1st, A bench vise, adjustable around two centers, at right angles to each other, substantially as set forth.

2d, The arrangement of cheeks, G and I, with tubular stems, F and H, capable of being slid one within the other, and secured within the divided yoke C, vibrating about a vertical stem, B, in combination with the nut, b, and screws, E and J, for regulating and fixing the adjustments.

76,585.—Steam Boiler Furnace.—Samuel P. Bartley, Columbus, Ohio.

I claim the funnel-shaped chamber or passage, D, in combination with circular or curve in rear of chamber, O, and the cold air pipe, E, constructed and operating substantially as and for the purpose described.

76,586.—Breech-Loading Ordnance.—Peter R. Beaupre, Metropolis, Ill.

I claim, 1st, The construction of breech-loading cannon, with the joint between the breech and barrel formed as described, with the center of the trunnions of the breech piece placed above the center of the bore, for the purposes specified.

2d, The breech strap, C, in combination with the expansion screws, F, provided with the clutch pin, T, substantially as and for the purpose set forth.

76,587.—Gun Lock.—Salmon Belden, and John Frankling Crabtree, Visalia, Cal.

I claim 1st, The lever, F, having a short arm connected with the tumbler by a link, and a long arm, to be held by the trigger, when at full cock, and released when the trigger is drawn for discharge, substantially as described.

2d, The safety catch, consisting of the lever, n, spring, p, and lever, r, together with the notch, o, shoulder, u, and the pin, v, the whole combined and operating substantially as and for the purpose described.

76,588.—Clutch for Elevating.—C. C. Blodgett, Watertown, N. Y.

I claim the clutch elevating and operating device herein described, of the accompanying drawings, arranged to operate in combination with a clutch or grapple, substantially in the manner and for the purposes shown and set forth.

76,589.—Adjustable Clothes Dryer.—H. Storrs Boynton, Cortland, N. Y.

I claim the mode of constructing and operating an adjustable clothes line upon wheels or pulleys, and regulated by weights consisting of the line, L, in combination with the wheels, S S', and the weights, O X, and axles, E E', with the posts, P P', and framework, B B', all constructed and operating substantially as set forth.

76,590.—Hot-Air Furnace.—Edward Brady, and John Sloan, Philadelphia, Pa.

We claim furnace, F, compartments, W W', dome, D, heating chamber, H C, air pipes, A P, movable top, T, cistern and evaporation boxes, R and R', connecting pipes, S P, S P', S P'', and C P, evaporation boxes, W B, smoke and gas escape apertures, O, all constructed and combined and operating in the manner and for the purposes above set forth and described.

76,591.—Lumber Dryer.—Joseph Brakely, Bordentown, N. J.

I claim, 1st, The chamber, A, and case, B, used in combination with the pipes, H E, and G, whereby I am enabled to apply heat to the chamber by means of steam, and at the same time draw off and utilize the vapor from chamber, A, as and for the purpose set forth.

2d, The use of a pipe leading from the lumber chamber into the pipe which supplies steam for heating said chamber, for the purpose of drawing away and utilizing the hot vapor from the lumber, substantially as herein set forth.

76,592.—Lamp Burner.—John W. Brimblecom, Lynn, assignor to William Carleton, Charlestown, Mass.

I claim a lamp burner, in which the deflector is capable of being adjusted, with respect to the wick tube, laterally, or in the direction of the length of the slot in the said deflector, substantially as and for the purposes herein shown and described.

76,593.—Cotton Press.—R. M. Brooks, Woodbury, Georgia.

I claim, 1st, The metal pieces, G G, and J, having flanges, e e, and d d, and used with the cross head, F, all constructed and used as specified.

2d, The straps, P P, and N N, used in combination with the metal pieces, G G, and straps, E, all constructed as and for the purposes specified.

76,594.—Cotton Gin.—R. M. Brooks, Woodbury, Georgia.

I claim the guide boards, D D, used in the chamber, B, of the roll box of a cotton gin, and operating as and for the purpose set forth.

76,595.—Breech-loading Fire-arm.—John Broughton, New York city. Antedated October 14, 1867.

I claim, 1st, The combination of the swinging breech piece, B, which, in opening, swings down through the open bottom of the breech receiver, the swinging recoil brace, H, working upon an axis, h, arranged, relatively to the axis of the breech piece, in or nearly in the same plane, perpendicular to the face of the closed breech piece; the lever, E, pivoted to the lower and rear portion of the swinging breech piece, and acting centrally upon the front of the brace, H, and through it upon the hammer, the spring or springs m, held in place by the trigger pin, n, and acting on the rear of the brace, H; the hammer, G, vibrating on the axis, h, independent of the brace, H, and with its head working relatively to the breech receiver, in such a manner that the slot in the upper surface of the receiver, through which the comb of the hammer projects, is filled by the said head both at the "down" and "full cock" positions of the hammer, the whole arranged and constructed to operate together, substantially as herein shown and described.

2d, The firing pin, J, constructed in the form of a hammer, and swinging within, but sufficiently independent of, the swinging breech piece, upon the same shaft or axis as the breech piece itself swings upon, as herein described.

3d, The hook, K, spring, L, and sector, J, in combination with each other and with the swinging breech piece and extractor, substantially as and for the purpose herein specified.

76,596.—Car Stake Holder.—George A. Brown, Kalamazoo, Mich.

I claim the combination of the plates, L, catches, J, circular projection, F, arms, d, and gravitating bolt, D, when constructed and arranged substantially as described, and for the purpose set forth.

76,597.—Horse Rake.—Nathaniel H. Brown, Derry, N. H., assignor to himself and Joseph A. Veazie, Boston, Mass.

I claim the teeth, a, with their wooden heads, b, in combination with the bars, D E, and the springs, m, constructed, arranged, and operating substantially as described.

Also, the device for elevating the teeth, a, consisting essentially of the arm or lever, G, in combination with the crank, H, operated substantially as set forth.

76,598.—Post Hole Auger.—Allen Burton, Chicago, Ill.

I claim, in combination with the hollow handle, A, the rod, C, arranged within said handle, and operating in the manner and for the purposes set forth.

76,599.—File for Grooving Rolls.—Henry L. Butts, Norwich, Conn. Antedated March 28, 1868.

I claim the within-described tool, as an article of manufacture, constructed and used as and for the purpose herein specified.

76,600.—Machine for Attaching Buttons to Fabrics.—George J. Capewell, West Cheshire, Conn. Antedated April 9, 1868.

I claim the bent lever, A, with elbow and journal formed of one piece, the conical formed, adjustable set screw, d, and spring, e, when combined and arranged substantially in the manner and for the purposes specified.

76,601.—Swing Cradle.—Patrick P. Carroll, Washington, D. C.

I claim the spring arm, F, connecting rod, G, and wrist crank, R, as arranged and combined with gear mechanism for swinging a car or cradle, substantially as and for the purposes herein set forth.

76,602.—Beehive.—John I. Cassel, and Wm. Quin, Eaton, Ohio.

We claim the hinged bottom, C, in combination with the perforated bottom of the honey box, F, all constructed substantially as and for the purpose set forth.

76,603.—Rubber for Washing Clothes.—James Charlton, Allegheny city, Pa. Antedated April 1, 1868.

I claim a rubber for washing clothes, said rubber consisting of parts, A and A', provided with handles, B, and corrugated face, f, and hinged together as herein described.

76,604.—Shuttle for Looms.—Silas E. Chase, Boston, Mass.

I claim the combination with the body of the shuttle, of the plug or base, f, and the bobbin spindle, with its appurtenances, hinged to said base, substantially in the manner and for the purposes herein shown and set forth.

76,605.—Sand Cap for Carriages.—A. O. Coleburn, and H. T. Standard, Wayne, Mich.

We claim the adjustable sand caps, c b, applied in connection with an axle and hub, as and for the purpose described.

76,606.—Churn.—Andrew J. Conner, Louisville, Ky.

I claim the combination of the churn, M, the shafts or double dashers, K K, with the wings or blades, L L, and the lid or cover, I, when arranged, and operating in the manner set forth.

76,607.—Steam Generator.—Benjamin Crawford, Pittsburg, Pa.

I claim the arrangement of a perforated plate, m, over the mouth of the steam pipe, g, inside of the boiler, in combination with the pipe, g, for the purpose hereinbefore described.

76,608.—Leather Trimmer.—Lewis P. Curtis (assignor to himself and Justin D. Barker), Marlboro, Mass.

I claim the knife or cutter, E, attached to the awl or needle carrier of a machine for sewing leather, and operating substantially as and for the purpose specified.

76,609.—Neck Yoke.—Albro S. Dow, and Elijah W. Wilcox, Cedarville, N. Y.

We claim, 1st, Constructing the attachment, which connects the neck yoke to the tongue or pole, with a swivel joint, formed as described, that is to say, by the combination of the socket, B, projection, E, and bolt, F, substantially as hereinbefore set forth.

2d, The combination of the metallic strap or case, C, and the leather ring, or its equivalent, D said case, C, being so constructed as to support the said ring, D, in front and at its edges, or beneath the pole, as described, said ring, D, being secured in position by screws, or other equivalent device, and the space behind said ring, D, being left open, substantially as described.

3d, The combination of the pad, K, with the metallic ring, which embraces the pole or tongue, in such a manner as to interpose the said pad between the tongue and that portion of the case, C, which lies directly between the said tongue and the under side of the neck yoke, substantially as and for the purpose set forth.

76,610.—Scrubber.—Jacob Edson, Boston, Mass.

I claim the combination and arrangement of a series of fine holes made in the reservoir, as described, with such reservoir, the strip of rubber and the valve, and valve opening applied to the reservoir, as set forth.

Also, the arrangement and combination of the burred plate, with the reservoir, when the latter is provided with a valve, D, and a strip of rubber arranged as set forth.

Also, the combination and arrangement of the guide tube, e', with the reservoir, provided with a cleaning strip, and a valve and valve operating lever, and holes of admission and emission, arranged as set forth.

76,611.—Improved Mortise and Tenon for Bedsteads.—William H. Elliott, New York city.

I claim, 1st, Cutting the shoulder, d, on one piece of wood, and the shoulder, e, on another piece of the same material, and fastening the two together, substantially as described, when said shoulders so operate upon each other and upon the post as to make the fastening self tightening, as herein set forth.

2d, The double tenon, c and c', when so constructed and applied that it shall become self tightening when in use, and at the same time serve the purpose of a cleat to prevent warping or checking, substantially as herein shown and described.

3d, The combination of pin, g, double tenon, c and c', side rail, b, mortise, h, with its depressions, h', cut in the material of the post, all being constructed and operating substantially as described.

76,612.—Screw-Cutting Lathe.—Charles Ellis, Canton, Mass.

I claim, 1st, The holding chuck, I, in combination with the self-centering chucks, substantially as described.

2d, The combination of the self-centering chucks, D and D', the holding chuck, I, and the revolving die holder, M, substantially as described.

3d, The combination of the chucks, D and D', and I, the revolving die-holder, M, and the tool carriage, U, when made substantially as described, and for the purpose specified.

4th, The adjusting collars, a and b, right and left screws, G G', in combination with the sliding jaws of a chuck, so that the said jaws shall always have their corresponding faces at an equal distance from the center of revolution.

5th, The employment, in combination with the right and left screws, G G', of the adjustable collars, a b, by which the jaws are centered, substantially as described.

76,613.—Brick press.—John M. Enos, St. Joseph, assignor to himself and Thomas Swartwout, Kalamazoo, Mich.

I claim the combination of the frame, D D', lever, L, arms, G H, plunger, F, platform, A, slide, B, mold box, C, spring, S, and rod, I, arranged to operate substantially in the manner and for the purposes set forth.

76,614.—Curb for Streets, Roads, etc.—Oliver Faurot and William Pond Harris, Brooklyn, N. Y.

We claim the construction and arrangement of the curb, as shown by the accompanying drawings, with the brackets, flanges, bolts, lugs, connecting blocks, bearings, supporters, etc., in the manner and for the purpose herein described.

76,615.—Machine for Cutting Corks.—Luther W. Felt, Keene, N. H.

I claim, 1st, Giving the required degree of taper to the cork to be cut by regulating the amount of vertical play of the collar, Q, upon the revolving shaft K, substantially as described.

2d, Regulating the amount of vertical play of the collar, Q, and consequently the degree of taper to be given the cork, by the rod, S, in combination with the post, B, lever, 36, link, 30, and yoked bar, R, with its ring, 27, operating substantially in the manner set forth.

3d, The blocks, O O, made removable for regulating the diameter of the cork to be cut, substantially as set forth.

4th, The grooved blocks, O O, in combination with the cutters, P P, substantially as and for the purpose set forth.

5th, Introducing a current of cold air within the center of the table, b, so as to impinge upon the edges of the cutters immediately after a cork has been cut, substantially as described.

6th, The "spring catch," H, operated by mechanism, substantially as described, to allow of the rod, J, being thrown up, at and for the purpose set forth.

76,616.—Oil Cup.—Charles Ferger, New York city.

I claim as my invention the combination, with an oil reservoir or oil cup for oiling the bearings, of a valve closed by spring, K, and raised at intervals by a positive motion, communicated by the pin, Q, or its equivalent, the parts being constructed as herein set forth.

76,617.—Brick Machine.—George B. Fisher, Chicago, Ill.

I claim, 1st, The combination of a series or chain of blocks, E, with a polygonal mold wheel, B, arranged and operating substantially in the manner and for the purposes set forth and shown.

2d, In combination with a revolving mold wheel, B, provided with plungers operating as described, the arrangement of the removable cams, D, and their supports, F, substantially in the manner and for the purposes described.

76,618.—Rasp.—Isaac Fisher, St. Louis, Mo.

I claim a rasp formed of thin blades of steel, a, having one or both of their edges serrated, and held together by means of screw bolts, a', substantially as herein shown and described.

Also, the arrangement of the plates, when their alternate numbers are constructed so as to slide on the connecting bolts, a', at a distance sufficient to place the serrations in transverse rows for the purpose of sharpening, as described and set forth.

76,619.—Machine for Dressing and Scouring Leather.—Edward Fitzhenry, Boston, Mass.

I claim the combination of a series of casters, E E etc., in manner substantially as set forth, with the tablet, A, and its supporting frame, the whole being substantially as described.

And in combination with a series of casters, a tablet and a supporting frame, arranged and composing parts of a machine, as and for the purpose described, an adjustable screw, or its equivalent, applied to each or any of such casters, for the purpose of effecting the adjustment of the caster wheel, or the same and its spindle, with reference to the tablet, in manner as explained.

76,620.—Hinge for Sleeping Car Berths.—Jedediah I. Fogg, Chicago, Ill.

I claim the combination of the boxes, b, and the spindles, d, when arranged with respect to the partitions, B, and berths, C, so as to operate substantially as and for the purposes specified.

76,621.—Guano Distributor.—Newton Foster, Palmyra, N. Y.

I claim as an improvement in machines for sowing fertilizers, the serrated-edged distributing bar, F, constructed as shown and described, and so arranged that the V-shaped teeth only of said bar shall be exposed to the material to be sown, substantially in the manner and for the purposes set forth.

76,622.—Hose Coupling.—R. John Gaines, Portland, Conn.

I claim a hose coupling, the male and female parts or butts of which are constructed substantially as hereinbefore described, and having a movable band or ring fitted upon the female part or butt of the coupling itself, and constructed substantially as hereinbefore to be used in connection with the catches, K K, of fig. 1, and the flange upon the inner end of the female part or butt.

Also, as a part of my device, the small screws passing through said ring, and extending into the grooves under said ring, upon the body of the female part, for the purpose of indicating when the grooves or slots in the said ring are on a line with the slots in the female part or butt, all of which is constructed substantially as hereinbefore described, substantially as and for the purposes herein set forth.

76,623.—Manufacture of Melodeon Stops and other Articles.—John Gardner, New Haven, Conn., assignor to Samuel Peck & Co.

I claim the above-described composition of matter for melodeon stops and other knobs, substantially as specified.

76,624.—Apparatus for Sprouting Malt.—Joseph Geemen, Chicago, Ill.

I claim, 1st, In combination with a water chamber, L, and chute, E, the arrangement of a series of floors, constructed substantially as and for the purposes set forth.

2d, The combination of a series of floors, constructed as described, with a chamber, L, and fountain, S, substantially as and for the purposes described.

76,625.—Thermometric Steam Gage.—D. M. Greene, Troy, N. Y.

I claim, 1st, The combination of the reservoir, B, and the exterior steam chamber, I, the glass tube, E, and a pressure gage scale attached thereto, determined by the expansion of the mercury or other fluid, by the heat of the steam conducted from the boiler to the steam chamber, I.

2d, The combination of the reservoir, B, the exterior steam chamber, I, the graduated glass tube, E, placed outside of a boiler having a steam connection therewith by a tube or flange.

3d, The drip tube, attached to the steam chamber, I.

4th, A coating of copper, or other suitable material, when applied to the surface of the mercury cup, substantially as and for the purpose set forth.

5th, The flexible bag, a, secured to the end of the tube, E, substantially as and for the purpose set forth.

6th, The process of graduating the gage, by applying steam to the steam chamber at a series of pressures, determined by a standard gage, and marking the position of the mercury or other fluid corresponding thereto.

76,626.—Harness for Breaking Horses.—Theophilus Hammond, Petersburg, Ind.

I claim the arrangement of the forked bar, C, with its perforated disk, and pulley, D, lever, F, and spring, in combination with the straps, E and R R, and harness, as herein described, all constructed and operating substantially as set forth.

76,627.—Subsoil Plow.—C. R. Hartman, Vincennes, Ind.

I claim, 1st, The concavo-convex and triangular shovel, D, secured to an extended heel piece, d, of the colter, C, and abutting against the shoulder, e, of said colter, substantially as described.

2d, The construction of the colter, C, upon the standard, C', so that the upper portion of the cutting edge of this colter shall form an obtuse angle with the front edge of the standard, C, in combination with the shovel, D applied substantially as described.

76,628.—Jack Scale.—H. M. Hervey, Madison, Ohio.

I claim the pedestal, A, screw, B, nut, C, and standard, E, as arranged in combination with the weigh beam, F, for the purpose and in the manner as set forth.

76,629.—Swing Carriage.—William Hewett, Trenton, N. J.

I claim the levers, D D, connecting the rods, B B, and the treadles, f f, and secured to the carriage by bolts, e e, substantially as and for the purpose described.

76,630.—Ball Caster.—Samuel S. Hickok, Methuen, and Daniel B. Clement, Boston, Mass.

We claim the ball caster, made in two sections as herein described, the one section consisting of the base, c, constructed with the slotted legs, h, in which the axles of rollers, e, are held, and the other of the cup, b, with the caster ball which it holds, attached to said base, in the manner and for the purposes shown and specified.

76,631.—Machine for Producing Reduced Copies of Medals, etc.—Charles John Hill, Regent's Park, England, assignor to Joseph Shepherd Wyon and Alfred Benjamin Wyon. Patented in England April 5, 1867.

I claim, 1st, The peculiar system or mode of an apparatus for ascertaining the correct length or depth of the cutter in relation to the tracer point, substantially as hereinbefore described, and illustrated by the accompanying drawings.

2d, The peculiar system or mode of and apparatus for determining the correct size of cutter to be used in relation to the size of the tracer point, substantially as hereinbefore described, and illustrated by the accompanying drawings.

3d, The employment, in this class of machinery, of removable mandrels, of different sizes, adapted to the various-sized cutters required, as hereinbefore described, and illustrated by the accompanying drawings.

4th, The employment in this class of machinery, of an arm, working on an universal joint at one end, and actuated by hand at the opposite end, such arm carrying an adjustable frame, with cutter mandrel and rotary cutter, and a fixed frame, with vertically-adjustable tracer, the whole being arranged and operating substantially as hereinbefore described, and illustrated by the accompanying drawings.

5th, The peculiar construction of rose cutters, as hereinbefore described, and illustrated by the accompanying drawings.

6th, The peculiar construction of finishing cutter, as illustrated by the accompanying drawings.

76,632.—Brace for Bits.—S.B. Hill (assignor to himself and Levi B. Taylor), Chicopee, Mass.

I claim the slide, a, in combination with the screw jacket, b, both constructed, arranged, and operating substantially as herein described.

76,633.—Bed Bottom.—Beecher Hitchcock, Waukegan, Ill.

I claim the arrangement of a long spring, I, for the foot of frames, A B, and a short spring, H, for their heads, in combination with side springs, having long arms, C, and short arms, G, substantially as and for the purpose set forth.

76,634.—Cultivator.—Lewis M. Holland, Galesburg, Ill.

I claim coupling the shovel beams, B, with the axle of the cultivator by means of the screw pivots, b, with cross pieces, e, fitting in the sockets of the plates, a, substantially in the manner and for the purpose as herein set forth.

76,635.—Pump Piston.—Henry S. Hopkins, Boston, Mass.

I claim, in combination with the flanges, b b, the segmental packing pieces, g, pressed outwardly by springs, and the joint blocks, h, constructed and arranged to operate substantially as set forth.

Also, in combination with the segments, g, the rubber springs, k, placed loosely in the recesses, l, and pressing the segments outward, substantially as set forth.

76,636.—Let-off Mechanism for Looms.—Daniel Hussey, Nashua, N. H.

I claim the combination of the differential gears, r s t, their ratchets, g v, and holding and impelling pawls, h w, with the shaft, k, of the yarn beam gearing, and with the whip roller or depresser, D, and mechanism for actuating the impelling pawl, h, substantially in the ways as hereinbefore described.

76,637.—Construction of Fence Posts.—Martin Krumm, Jr., Columbus, Ohio.

I claim a transversely-expansible post, A, having its vertical portions united at the top by one or more springs, A', substantially as shown and described.

76,638.—Ice Pitcher.—George Lane (assignor to himself and Benjamin W. Hicks), New York city.

I claim constructing a pitcher for containing ice water, with spouts, F F, trunnions, G G, stand, A, and float, E, substantially as and for the purposes set forth.

76,639.—Butter Dish.—Nathan Lawrence (assignor to Reed & Barton), Taunton, Mass.

I claim the combination and arrangement of the spring latches, g g, with the vase, and for the purpose of receiving and holding the bearings or boxes of the journals of the cover, and admitting of their removal, in manner substantially as specified.

76,640.—Device for Fettering Horses.—A. H. Lewis, North Greenbush, N. Y.

I claim the strap, a, in combination with strap, b, and the loops, e e', as and for the purpose set forth.

76,641.—Stove Polish or Blacking.—Jerry Lewis, Albion, N. Y.

I claim a mixture, of the ingredients above mentioned, in about the proportions specified, for the purpose set forth.

76,642.—Apparatus for Removing Hides from Animals.—Philo Lull, Norwich, N. Y.

I claim the rod, or its equivalent, constructed and operated for the purpose and substantially as herein set forth.

76,643.—Pump Piston.—Sylvester G. Mason, Rochester, N.Y.

I claim the combination of the segmental openings, c c, formed as above described, and the valves, G G, resting in said openings, with the segmental packing rings, H H, so arranged as to inclose said valves, and to act as packings, and retain the water in the piston, as herein set forth.

76,644.—Clamp for Holding Pickets.—Peter McCarthy, Rochester, N. Y.

I claim the head blocks, B and B', when constructed with projections, c, and arranged in relation to a clamp, substantially in the manner and for the purpose described.

76,645.—Lamp Burner.—William C. McGill, Cincinnati, O.

I claim, 1st, The elastic, tubular, and perforated stem, C, substantially as described and shown for the purposes set forth.

2d, The combination of the collar, D, tube, G, ring, F, with elastic wings, f f, all constructed and arranged substantially as shown and for the purposes herein set forth.

3d, The conductor, E, formed and arranged as and for the purpose set forth.

4th, The combination of ring, F, and elastic wings, f, and air conductor, E, when constructed and arranged as herein shown and described and for the purposes heretofore set forth.

76,646.—Conductor's Register.—William C. McGill, Cincinnati, Ohio.

I claim, 1st, The actuating knob, H, and teeth, G G, in the described combination, with the recording and striking devices, substantially as set forth.

2d, In the described combination, the half-fare register slide, P, and ticket receptacle or pocket, Q, upon or within a conductor's register, substantially as described.

3d, The double register for recording full and half fares, constructed and adapted to operate substantially in the manner set forth.

76,647.—Stamping Press.—Albert G. Mead and Charles J. Addy, Boston, Mass.

We claim, 1st, The reversible swivel step, a, in combination with the reversible or swivel chuck, d, for the purpose and substantially as described.

2d, The slide, A, and screw, D, and spiral spring, E, or equivalent, when combined with the head, C, of the stand, for the purpose and substantially as described.

76,648.—Metallic Bird House.—Henry Miller, Cranston, assignor to himself and George O. Miller, Johnston, R. I.

I claim the metallic bird house, constructed substantially as described, as a new article of manufacture.

76,649.—Churn.—Marshal Morse and P. W. Sawyer, Gray, Me.

We claim the single-dash churn, as described, said dash being operated by crank, g, gear, i, pinion, e, crank shaft, d, irregular balance wheel, h, driving rod, l, having the spring catch, k, said churn also having the slides, b, sock-

ets, c, and slides, o, moving in grooves, n, on divided cover, m; the said driving devices also being intended to be removable, as described, for the purpose of being attached to any common cylindrical churn, and all as set forth.

76,650.—TOILET COMB.—Joseph P. Noyes, Binghamton, N. Y.

I claim, as a new article of manufacture, a comb provided with a metallic back, extended over the ends thereof, so as to form the end tooth or covering therefor, as represented and described, for the purpose set forth.

76,651.—PROPELLER.—Charles M. O'Hara, New York city.

I claim the reversible buoyant propeller, constructed and arranged to operate as herein described.

76,652.—MOLD BOARD FOR PLOW.—James Oliver, South Bend, Ind.

I claim the mold board, B, annealed as set forth, as a new article of manufacture.

76,653.—LAMP BURNER.—George K. Osborn, Brooklyn, N. Y.

I claim the combination of the jacket, B, surrounding the wick tube, A, the tube, C, placed a little above the wick tube, A, and the passages, D D, running from the bottom to the top of the tube, O, all arranged as and for the purposes specified.

76,654.—INDUCTING COIL APPARATUS AND CIRCUIT BREAKER. Charles Grafton Page, Washington, D. C.

I claim, 1st, An induction coil apparatus, consisting of a primary and secondary circuit, when said secondary circuit is many times, that is to say two, three, or more times, the length of the primary circuit, having the connections so arranged that shocks, sparks and electrostatic results may be obtained from the secondary circuit alone, or from the combined primary and secondary circuits, or from the primary alone, or from portions of either circuit, substantially as set forth.

2d, The combination of an automatic circuit breaker with either a primary coil alone or a primary and secondary coil combined, substantially as set forth.

3d, The combination of a mechanical circuit breaker with a primary and secondary coil combined, substantially as set forth.

4th, The combination of both a mechanical and automatic circuit breaker with a primary and secondary coil, combined substantially as set forth.

5th, The combination of a primary and secondary coil, enclosing an electro magnet, with an automatic circuit breaker, substantially as set forth.

6th, The combination of a primary and secondary coil, enclosing a compound or divided electro magnet, with an adjustable automatic circuit breaker, substantially as set forth.

7th, The combination of a primary or secondary coil, enclosing a compound electro magnet, with an attached hammer circuit breaker, substantially as set forth.

8th, The spark arresting circuit breaker, when used with a primary coil alone, or a primary and secondary combined, substantially as set forth.

9th, The spark arresting circuit breaker, whether used with a coil or coils, enclosing an electro magnet, substantially as set forth.

10th, The spark arresting circuit breaker, whether attached to or independent of the primary or primary and secondary coils, substantially as set forth.

11th, The adjustment of the retractile force of an automatic circuit breaker, substantially as set forth.

12th, In combination with such adjustment, adjusting the distance of the hammer or the armature from the pole or poles of the electro magnet which actuates them, as set forth.

13th, Adjusting or regulating the length of vibration of the circuit breaking bar, by means of a set screw, or any mechanical equivalent, for substantially the same purpose, substantially as herein set forth.

14th, The employment of one electro magnetic instrument to open and close the circuit of another electro magnetic instrument, using either one battery for both or separate batteries for each, substantially as herein set forth.

15th, The employment of separate and independent batteries to operate an electro magnetic circuit breaker, and the circuit which is broken by it, substantially as set forth.

76,655.—CONDENSER.—Wm. Phelan, Peoria, Ill.

I claim, 1st, The two cones, A, B, the space between these provided with a spiral partition, thus forming a spiral chamber, surrounded by cold water, for the purpose of condensing steam or vapor, in the manner indicated.

2d, The supply pipe and valve, l n k, in connection with a condenser of the construction indicated, to supply the incidental waste of water.

76,656.—VISE.—Belvill L. Randall, Roxbury, Mass.

I claim the combination of the jaw, b', and annularly grooved tenon, f, with the base, c, and pin, g, the said parts being constructed and arranged as herein described, and both base and tenon being perforated to receive a pin or bolt for rendering the said jaw immovable when desired, as and for the purposes shown and set forth.

76,657.—SULKY HARROW.—Benj. Randall, Adams, N. Y.

I claim, 1st, The connecting of the sulky to the harrow by means of an elastic bar, C, attached to the front ends of the thills, B B, and to an upright, E, on the front part of the harrow, substantially as shown and described.

2d, The upright, E, attached to the front end of the harrow, and having the whiffletree and elastic bar, C, connected to it, substantially as and for the purpose specified.

3d, The adjustable caster, d, attached to the front end of the harrow, when the same is constructed and arranged so as to operate substantially as described.

4th, The combination of the upright, E, and draft hook, b, when the same are constructed and arranged so as to operate substantially as described.

5th, Attaching the rope, H, to the harrow, substantially as and for the purpose specified.

76,658.—CORN PLANTER.—Benj. Randall, Adams, N. Y.

I claim, 1st, The seed slide, F, and the springs, d d, when the latter are arranged within the seed box, E, and the whole so combined as to operate substantially as described and for the purpose specified.

2d, The seed slide, F, when arranged in relation with the spring, d, cam, H, and the lever, M, substantially in the manner as and for the purposes set forth.

3d, The elastic furrow openers, L, arranged and applied in connection with the shaft, J, substantially as shown and described.

4th, The tube, G, and bar, I, in combination with the covering shares, f, and roller, g, when the same are constructed and arranged substantially as described.

5th, The bar, I, attached to the lower end of the seed tube, G, and provided with the covering shares, f, and roller, g, in combination with the shaft, J, arm, l, and chain, h, all arranged to operate in the manner substantially as and for the purpose set forth.

76,659.—CLOTHES' WRINGER.—Benj. Reed, Allegheny, Pa.

I claim the spring yokes, A and B, in combination with the rollers, C and D, constructed, arranged and operating substantially as described, and for the purpose set forth.

76,660.—MODE OF PRINTING PHOTOGRAPHIC PICTURES.—Isaac Rehn, Philadelphia, Pa.

I claim the combination of the pigment with the salted albumen and silver solution, for the purposes set forth in the above specifications.

76,661.—HORSE HAY FORK.—Andrew Reynolds, Rock Springs, Md.

I claim a single spiral tine, E, secured to a central straight tine, F, so that they both turn while the instrument is being forced into the hay and liberated from it, substantially as described.

76,662.—WAGON JACKS.—Alexander Ross, Freeport, Ill.

I claim a wagon jack having a lock arranged with a loop, F, arm, E, and lug, G, in combination with the lever, C, notched standard, B, and catch, D, substantially as and for the purpose set forth.

76,663.—SPRING MATTRESS.—John W. H. Scott, Rochester, N. Y.

I claim the combination of the springs, E, and the diagonal webbing, C, and the crossing, D, with a proper frame, as specified.

76,664.—BUREAU BEDSTEAD.—Edward Shackford and Derk Arnaud, Boston, Mass.

We claim, 1st, A bedstead made in two parts, hinged together, when arranged with the case and its door, so that the bedstead when in use shall be outside of and parallel with the front of the case, substantially as and for the purpose specified.

2d, The arrangement of the bedstead, A B, and crib, E, with the case and its doors, D G, all substantially as and for the purpose specified.

76,665.—SEE SAW OR TILTING APPARATUS.—Amory F. Sherman, Roxbury, Mass.

I claim the combination of the tilt seats or chairs and a means, substantially as described, of maintaining them in horizontal positions while the tilt may be in action.

Also, the parallel tilting bars, as made with notches or equivalents in their lower edges, as and for the purpose described.

Also, the arrangement and combination of the adjustable double inclined plane foot rest, with the seats or chairs, and the tilting parallel motion bars and boards applied to such chairs and standards, as explained.

Also, the combination and arrangement of the anti-concussion buffers with the tilt, as described.

76,666.—THILL COUPLING.—Geo. C. Smith and Roswell Judson, Matteawan, N. Y.

I claim the coupling strap, B, when constructed and used substantially as and for the purpose specified.

76,667.—BEARING FOR FIFTH WHEEL OF CARRIAGES.—Simon B. Smith (assignor to himself and Joseph K. Chew), Salem, N. J. Antedated March 31, 1868.

I claim, 1st, The head block, a'', the perch' bearing, a''', and the disk, a', when cast together in one piece of metal, substantially as and for the purpose described.

2d, In combination with the combined mechanical devices of the preceding claim, the king bolt, K, when constructed and applied as described and shown, for the purpose specified.

76,668.—STOVEPIPE SHELF.—L. C. Stiles and R. P. Jackman, Elgin, Ill.

We claim the combination of the disk, B, clasp, H, and set screw, L, together with the rotating disk, C, attached to disk, B, all constructed and arranged substantially as and for the purpose described.

76,669.—CAN OPENER.—Nathaniel F. Stone, Chicago, Ill.—Antedated April 1, 1868.

I claim the plate, b, provided at one end with a cutter blade, d, at the opposite end, with a projection or heel, s, in combination with the screws, c c, and the plate or slotted bar, B, substantially as specified.

76,670.—BUNG.—Conrad C. Stremme, Austin, Texas.

I claim, 1st, The combination of the bung with the socket, the bung being secured by means of the teeth, d d, working in inclined slits inside the socket, thereby making a water tight lock for a barrel without shouldering or the use of packing.

2d, The vent or air valve constructed as shown, in combination with the bung, as substantially set forth.

76,671.—DOOR BOLT AND LOCK.—Charles Sulzman, Waterford, N. Y.

I claim the combination of the sliding bolt and locking pin, with its actuating spring, or the grooved wheel or disk, and bridge which it carries, arranged to operate in connection with the bolt, substantially in the manner and for the purposes shown and set forth.

2d, In a bolt or lock such as described, providing the grooved wheel or disk with a bridge or stud capable of being removed from and adjusted to any one of the sockets formed in the annular grove of the said wheel, substantially as and for the purposes shown and specified.

76,672.—MACHINE FOR CURBING WELLS.—James A. Sutherland, Elmwoood, Ill.

I claim, 1st, The combination and arrangement of staves, A B, with iron straps, a a, b b b b, and hinge joints, c, as shown in fig. 5, in the manner and for the purpose herein described.

2d, The combination and arrangement of the straps, e e, and pin, f with the staves, A B, in the manner and for the purpose herein described.

76,673.—FLY TRAP.—Geo. J. Swingle, Knoxville, Ill.

I claim the arrangement of the receptacle or prison, A, gauze door, y, trap cover, B, with prongs, X, cloth screens, b b, trap door, C, rollers, D D, with prongs or curved pins, Z, rod, d, pan, E, and rods, O O, the whole combined and operating substantially in the manner and for the purpose as herein set forth.

76,674.—BED BOTTOM.—Wm. H. Tambling, Mazo Manie, Wis.

I claim the arrangement of the grooved boards S, angular wires, D, bands E, slats, h, and movable bars, F, constructed and used substantially as set forth.

76,675.—WATER TANK FOR STOVES.—Gottfried Tennie, Pittsburg, Pa., assignor to Frank S. Bissell.

I claim the flue box, A, made separate from a boiler, and applied around the flue collar of a stove, so that it serves as a means whereby to support a flue boiler above said collar of the stove, substantially as and for the purposes described.

76,676.—ROTARY STEAM ENGINE.—Flavius J. Van Vorhis and Thomas C. Workman, Stockwell, Ind.

We claim, 1st, The construction of the case, A, substantially as set forth.

2d, The construction and arrangement of the piston, B, and valves, D, substantially as set forth.

3d, The arrangement of the valves, D, with the piston, B, and cam groove, C, substantially as set forth.

4th, The arrangement of the steam passages, I I I, with the valves, D, and the cavities, I, substantially as set forth.

5th, The arrangement of the valves, D, with the passages, H, and ports, E, substantially as set forth.

6th, The arrangement of the reversing valve, e, the steam induction ports, E, and exhaust ports, F, substantially as set forth.

76,677.—SAW MILL.—Londus B. Walker, Chicago, Ill.

I claim, 1st, The frame, B, pivoted as described, and constructed to sustain the feed rollers and their driving wheels, with slots and bolts, or their equivalents, to admit of the vibration of the frame, substantially in the manner and for the purposes specified.

2d, The slides, C C, which carry the feed rollers and gear wheels, in combination with the lever, L, rods, r and t, connecting link and adjusting nuts, all arranged and operating in the manner and for the purposes set forth and described.

76,678.—BOTTLE FOR HOLDING HYDROFLUORIC ACID.—David P. Webster, New York city.

I claim, 1st, The preparation of bottles for receiving hydrofluoric acid, by cutting them internally and externally with asphalt of coal tar, or the herein described composition of gum shellac and india rubber, as set forth

2d, As an article of manufacture, a bottle made of wood or papier mache, or other like material, coated externally and internally with a composition of varnish not affected by hydrofluoric acid, substantially as shown and set forth.

3d, Making the bottle for holding hydrofluoric acid of wood, and in two parts or sections, united substantially in the manner and for the purposes shown and described.

76,679.—SMELTING LEAD ORE.—David P. Webster, New York city.

I claim the improved process herein described for smelting or reducing phosphurets or phosphates of lead.

76,680.—PULLEY AND GEARING FOR MACHINERY.—Seth Wheeler, Albany, N. Y.

I claim, 1st, The mode substantially as herein described of constructing a pulley or gear wheel so that a portion of its rim and of the metal forming its hub or eye may be readily removed for the purpose of getting it off or on a shaft or axle.

2d, The construction of a pulley or gear wheel in such a manner that its detachable part or parts are held in their proper relation, and the pulley held on the shaft by the action of the same key or screw, or keys or screws, substantially as described.

3d, The jogs, g g', in combination with a key or screw and key, in the construction of a two part pulley gear wheel, substantially as and for the purpose described.

4th, The construction of the arm, B1, of a pulley or gear wheel, substantially in the manner and for the purpose described.

5th, The pulley or gear wheel made in two parts, one of which parts constitutes more than half of the pulley, and the other part less than half, the parts being united and held together substantially as described.

6th, The construction of the parts, B2, of the pulley or gear wheel, substantially as and for the purpose described.

76,681.—PLOW.—Cornelius Wilkins, Dundas, Ill.

I claim, 1st, In combination with the standard, b, of a steel or other similar plow, the bar, C, secured to said standard by bolts or rivets, c, and having a threaded or slotted portion, c', for uniting said standard to the beam, substantially as described.

2d, Securing the colter E, by passing it through an opening b5, in the breast of the plow and fastening it with a bolt or rivet, e, on the inside, substantially as and for the purpose specified.

76,682.—ROTARY VALVE.—Enos D. Wood, Utica, N. Y.

I claim the valves, G, with the openings, H, between them and the hub, E, constructed substantially as described.

76,683.—HAIR CRIMPER.—G. W. Wood, Philadelphia, Pa.

I claim two-tined hair crimper, A, with outwardly curving ends, in combination with the expanding and fastening slide, B, as a new article of manufacture, substantially as shown.

76,684.—CONSTRUCTION OF TEA AND COFFEE POTS.—Douglas B. Woodworth, Cincinnati, Ohio, assignor to the Cincinnati Britannia Company.

I claim the sheath or sole plate, C, of refractory metal, secured beneath the bottom of a Brittania tea or coffee pot, in the manner and for the purpose explained.

76,685.—PROCESS OF TREATING MUSLIN FOR SWEAT LININGS, ETC., FOR HATS.—Wm. P. Wright (assignor to himself and C. W. Walton), Philadelphia, Pa.

I claim the within described process for treating muslin for hat sweats, etc., so as to give it elasticity and pliability, as herein set forth and described.

76,686.—BAG HOLDER.—Jacob Yaggy and Tobias R. Yaggy, Plainfield, Ill., assignors to Tobias R. Yaggy.

We claim the combination of the post, A, the legs, C C, the rim, D, hinged rim, F, and clasp, G h, arranged and operating substantially as and for the purposes specified.

76,687.—LAND TILLER.—Geo. W. Zeigler, Maumee, Ohio.

I claim, 1st, Providing a single beam, A, carrying a gang of plows or shovels, with a draft rod, D, which is pivoted at or near the middle of the length of said beam and supported at or near its front end by means of a laterally vibrating beam, L, substantially as described.

2d, Supporting the front end of a draft rod, D, which is pivoted to the eye, h, of the intermediate stock, B, by means of a laterally and vertically adjustable segmental clevis, N, applied to the beam, L, substantially as described.

3d, The adjustable casting, G, provided with the standard, J, and adjustable standards, l l, for sustaining the handles, J, and allowing these handles to be secured at their front ends by means of a clamping bolt, j, substantially as described.

4th, Providing for adjusting the handle, J, of a single beam plow in line with a draft rod, D, by means of devices, G and L, which are arranged to operate substantially as described.

5th, A metallic standard stock and holder, B, constructed with a curved front edge, b, a swelled corrugated surface head, c, and a slot, a substantially as described.

6th, The wooden shovel carrying standard, C, applied to a stock, B, substantially as described.

7th, The construction of the clevis, N, of a segment form, with a notched flange, p, and also with perforations through it for receiving the draft rod D, substantially as described.

8th, A single-beam gang plow which is provided with laterally adjustable shovel standards, B C, laterally adjustable handles, J, a vertically and laterally adjustable clevis, N, a laterally adjustable arm or beam, L, all arranged substantially as described.

76,688.—BROOM HEAD.—Albert Alden, East Cambridge, Mass.

I claim, 1st, The manner of securing the corn or broom material to the head by clamping its stub-ends between the bars, B and C, and tying it by a string, F, and confining it in position to a band, F, or its equivalent, substantially as herein shown and described.

2d, The broom head, formed by combining the cross head, B, slotted or perforated bar, C, bolts, a, band, E, or its equivalent, and spring, F, with each other, substantially as and for the purpose set forth.

76,689.—CORN PLANTER.—E. W. Allen, Auburn, N. Y.

I claim, 1st, Operating the movable plates, z z, by means of the revolving arms, S S, levers, h h, and spring, L, with its connecting rod, j, the several parts being constructed and arranged substantially as and for the purposes herein set forth.

2d, The combination of the plows, B, double coverers, J J, rollers, K, spouts F, and movable plates, z, operated by the reel arms, S S, springs, L, and rod, j, the whole constructed and used substantially as specified.

76,690.—SPIRIT METER.—J. G. Allen, Philadelphia, Pa.

I claim, 1st, Delivering the spirits into a series of cells, P', provided with strainers at their outlets, substantially as described, to prevent the entrance into the meter of any foreign substances.

2d, The tilting measuring cells, C, provided with the sample spouts, E, arranged to deliver the samples into the funnel, G, substantially as described.

3d, A series of sample chambers or tubes, L', arranged to receive the samples as they are delivered from the funnel, G, through the spout, d, or equivalent means.

4th, Providing a meter with the rotating spout, d, arranged to be operated by the movements of the measuring apparatus, so as to deliver the samples to the sample tubes in succession, substantially as set forth.

5th, Making the sample tubes, L', with double glass walls, as described, for the purpose of preventing the evaporation of the samples by heat.

6th, Providing the sample tubes with a valve, l, arranged to be opened by the movements of the arm, e, or other part of the meter, to permit the entrance of the sample, and be closed again when the sample is in, to prevent evaporation.

6th, Providing the sample tubes with a valve or cock at their bottom, to be opened by the incline, r, on the arm, K, attached to and operated by the disk, H, or equivalent means, to draw off the samples, as described.

8th, Providing a spirit meter with a series of radial tubes, N, so arranged that any material movement of the meter will cause the contents of said tubes to flow out into and be retained in the vertical cups, R, substantially as and for the purpose set forth.

9th, The use of a measuring wheel composed of a series of cells or compartments, C', arranged as represented in fig. 2, and herein described.

10th, Constructing and arranging the measuring cups or cells of meters, as herein described, so that the leverage shall be uniform, whatever the quantity or specific gravity of the fluid being measured.

11th, Making the pipes leading to or from the meter double, or incasing them within a second tube, to prevent tapping them or artificially cooling or heating them, or abstracting liquor therefrom by capillary holes, substantially as described.

76,691.—SHINGLE MACHINE.—J. E. Austin, Oswego, N. Y.

I claim the combination of the pivoted tables, L L, with the sliding blocks, M M, having the shoulders, m m, and operating the tables, substantially in the manner and for the purposes specified.

76,692.—ELEVATOR.—J. S. Baldwin, Newark, N. J.

I claim the withdrawal of the yielding platform or edge, B, by the action of an interposed body, by means and in the manner described.

76,693.—ELEVATOR.—J. S. Baldwin, Newark, N. J.

I claim the checking or stopping of the elevator by the pressure of an interposed body upon the bar, D, or its equivalent, said pressure being transmitted and applied by the means and substantially in the manner described.

76,694.—ELEVATOR FOR TRANSPORTING PASSENGERS.—J. S. Baldwin, Newark, N. J.

I claim the elevator for buildings having floors of varying hight, constructed substantially in the manner set forth.

76,695.—BUTTONHOLE LINING FOR CARRIAGE CURTAINS.—John Barclay, Attleborough, Mass., assignor to himself, R. D. Case, Jas Barclay, and Daniel Bing, New York city.

I claim a carriage-curtain buttonhole lining, consisting of the three annular plates, B C and D, and of the eyelet, E, all made and operating substantially as herein shown and described.

76,696.—DEVICE FOR PRINTING HAT BODIES.—Alfred Barnes, Newark, N. J.

I claim the die, s, operated by the screw shaft, b, whereby a continuous spiral line is printed upon the body of the hat, B, while on the cone, as herein described for the purpose specified.

76,697.—OYSTER RAKE.—Asa Barrett (assignor to himself and M. D. Mettee), Baltimore, Md.

I claim the instrument above described, consisting of the rake heads, A A, teeth, a a, springs, S, and weight, B, in combination with the crossed rods or arms, C C, and the connecting rods, D D, and link, E, substantially as and for the purpose specified.

76,698.—GRADING MACHINE.—W. C. Bartlit, Aledo, and J. M. Merryman, Malone, Ill.

We claim, 1st, The arms, H, when so connected with the frame, A, and scraper, E, as to swing vertically, when the scraper revolves, substantially as herein set forth.

2d, The lock levers, U and V, in combination with the arms, H, and scraper E, when arranged to lock the arms and keep the scraper from revolving, and at the same time admit of the front of the scraper being elevated or depressed to receive its load, substantially as herein described.

3d, The shaft, K, and arms, L, when arranged in connection with the front of the scraper, E, with the lugs, M, and lever, N, or their equivalents, so that the operator can raise or lower the front of the scraper at pleasure, substantially as and for the purposes specified.

76,699.—WATCH PROTECTOR.—Carl Baumann, Poughkeepsie, N. Y.

I claim, 1st, A watch protector, consisting of a spring plate, A, and of the bent rod, B, which is fastened to the plate, and between the upper part of which plate and rod the stem of the watch is clamped, substantially as herein shown and described.

2d, Forming a hook, b, on the lower end of the spring plate, A, of a watch protector, substantially as and for the purpose herein shown and described.

76,700.—RAT TRAP.—Richard Beem, Antrim, Ohio.

I claim, 1st, Arm, F, with its serrated arms, f and f', catch, c, and knob, in combination with main spring, B, and shaft, E, when constructed and operating substantially in the manner and for the purposes set forth.

2d, Spring, I, when constructed and operating substantially in the manner and for the purposes set forth.

3d, Trigger, T, with its guide, G, when constructed and operating with lever, L, and bait arm, n, substantially in the manner and for the purpose set forth.

4th, Arm, F, shaft, E, spring, B, when constructed and operating in combination with spring, I, trigger, T, guide, G, lever, I, bait arm, n, body, A A' and bottom, s, substantially in the manner and for the purposes set forth.

76,701.—IRONING BOARD.—G. I. Birch, New York city.

I claim the combination of the board, A, hinged end frames, B D D B' and E D' D E', with the bottom frame, B'' B'' C C, and hinged slide, n, all substantially as shown and described and for the purpose set forth.

76,702.—APPARATUS FOR TURNING LOCOMOTIVE CRANK PINS.—W. Blythe and N. Hayes, Alexandria, Va.

We claim, 1st, The reversible and adjustable end-centering device, in combination with the outer and inner cylinder, or either of them, when combined therewith, substantially as described.

2d, The exterior cylinder, carrying the tools, S S, in combination with the inner and stationary cylinder, when arranged substantially in the manner set forth.

76,703.—DUMPING PLATFORM FOR HARVESTERS.—Jacob W. Bope, St. Louis, Mo., assignor to himself and George R. Chittenden, Chicago, Ill.

I claim, 1st, A tilting platform or dropper turning upon an axis at or near its rear edge, in combination with a hinged extension or tail piece for adapting said platform for use in tall grain.

2d, A hinged folding extension or tail piece, in combination with an anti-friction rod or guard on the platform, for the purpose as described.

3d, A tilting platform or dropper turning on a pivot or fulcrum at or near its rear edge, operated by means of a lever crank or arm attached to said pivot or fulcrum, substantially as described.

4th, A tilting platform or dropper turning upon a pivot or fulcrum located at or near its rear edge, in combination with arm or lever, F, attached to said fulcrum, adjustable rod, L, arm or lever, K, rockshaft, J, and foot piece or treadle, I, substantially as described.

5th, A tilting platform, in combination with a means for adjusting said platform and setting it up or down, or nearer to or further from the cutting apparatus.

7th, The adjustable arm, D', forming the support for the pivot at the inner end of the tilting platform, substantially as described.

8th, The adjustable swinging arm or support, H, in combination with the hook pivot or fulcrum, G, at the outer end of the tilting platform, substantially as described.

76,704.—COAL EXCAVATING MACHINE.—Job Borton, Antrim Ohio.

I claim, 1st, The picks or chisels, M' M', sledges, M M, and cams, c c, operated by shaft, H, and wheel, I, in combination as described, and operating as and for the purposes set forth.

2d, Cam roller, a', on shaft, H, adjustable arm, l l, connecting rod, b, arms, b' and b, on rock shaft, b'', pawl, o, and ratchet wheel, R, in combination with cog wheels, S S, as described, and operating as and for the purposes set forth.

3d, In combination with a mining machine thus constructed, crank shaft, G, balance wheel, F, and gear wheel, K, pitman, N, constructed and operating as described and set forth.

4th, The combination of the chisels or picks, M' M', with the transversible frames, B and C, carrying the intermediate devices, constructed as described and operating as set forth.

76,705.—UMBRELLA.—J. E. Boyce and R. Harrington, Birmingham, Eng. Patented in England, June 17, 1867.

We claim, 1st, The combination, with the umbrella or parasol stick, and studs or projections thereon, of the slotted runner and lever, constructed, arranged, and applied to said runner, substantially in the manner described, so that while the runner rides or passes over the studs, one arm of said lever will engage with one or the other of said studs, and thus fix the umbrella or parasol in its open or closed position, as shown and set forth.

2d, One or more bow springs, made from sheet steel, or other elastic metal, applied to the taper stick of an umbrella or parasol, so as to steady the runner thereon, substantially as herein shown and described.

76,706.—DETACHABLE BALL JOINT.—Henry Brevoort, Brooklyn, N. Y.

I claim, 1st, The ball joint, constructed as described, consisting of the shell A, open at one end, and provided at its opposite end with the slot having the shoulder, b, whereby, as the ball is introduced into the shell, and its shank turned in the wider part of the slot it will strike said shoulders and be locked in the shell until turned again, so that its narrower part will enable the ball to be withdrawn from the slot, as herein shown and described.

2d, The ball joint, constructed as described, in combination with the bracket B, or screw, B, as herein described for the purpose specified.

76,707.—PORTABLE COOKING STOVE.—Harvey Brown, Harlem, N. Y.

I claim, 1st, The connecting together of the side and end plates, A B, and bottom plate, C, of the stove, by means of the hooks, b i, and slots, a c, substantially in the manner as shown and described.

2d, The pawl, D, and lug, e, in combination with the hooks, b d, and slots, a c, all arranged substantially as and for the purpose set forth.

3d, The lid or cover, E, provided with the inclined plates, h h, for the purpose of admitting of the lid or cover being tightly fitted on the stove, or more or less elevated, as described.

4th, The bent or angular wires, F F, and bail, G, arranged and applied to the stove, substantially in the manner as and for the purpose specified.

76,708.—CORSET SPRING.—S. H. Brown and C. H. Willets, New York city.

We claim, 1st, A corset spring, composed of two parts, b b*, connected so that the spring can be lengthened or shortened, substantially as set forth.

2d, The slide, a*, moving between the parts, b b*, of the spring, A, in combination with the fastening, a', substantially as and for the purpose described.

3d, The adjustable button, c, in combination with an extension corset spring A or A', substantially as and for the purpose set forth.

76,709.—HAND CORN PLANTER.—D. Broy, Canton, Mo.

I claim, 1st, The combination and arrangement of the forked bars or boards A and B, plates, C and D, channels, H, slide, F, cap or block, G, and seed box E, with each other, substantially as herein shown and described, and for the purpose set forth.

2d, Forming the upper edge of the partition, I, that separates the channels, H, from each other, sharp or wedge-shaped, substantially as herein shown and described, and for the purpose set forth.

76,710.—BROOM.—J. Buercky (assignor to himself and J. C. Bandtel), Overpeck's Station, Ohio.

I claim the combination of the rod, b b, link, d, nuts, c c, bent wires and band, f f' and g, with the perforated ferrule, e, and handle, A, when the parts are constructed, arranged, and applied for securing the wisp, B, in the manner and for the purpose described.

76,711.—SHIFTING-BUCKET PROPELLER.—Jacob Busser, Philadelphia, Pa.

I claim the arrangement of the frames carrying the shifting buckets upon the bottom of or underneath the boat, so that both series of buckets shall

work in the same plane, and guarded, guided, and shifted for changing the direction of the boat by devices, substantially such as set forth and described.

76,712.—WATER ELEVATOR.—Wm. H. Castle, Washington city, D. C.

I claim the combination of the slot, L, in the crank head, the spring, M, the tooth, N, cap, O, and toothed wheel, Q, when constructed and arranged as and for the purpose set forth.

76,713.—ANIMAL TRAP.—J. J. Cline, High Hill, Ohio.

I claim the combination of the door, D, rod, E, and lever, F, as arranged with door, N, rod, H, lever, G, and cord, K, for forming a self-setting trap, as and for the purpose herein set forth.

76,714.—PLOW.—G. W. Cole, Canton, Ill.

I claim, 1st, The adjustable cap, a, secured to standard, b, as described, and operating substantially as set forth.

2d, The segment-faced shoe, f, working on plate, g, as described, in combination with the cap, a, or equivalent attachment, arranged substantially as and for the purposes set forth.

3d, The combination of the vertical and lateral adjustment of the beam, when the different parts are constructed and operated substantially as set forth and described.

76,715.—CAR BRAKE.—G. W. Combs (assignor to himself and J. B. Murray & Sons), Canandaigua, N. Y.

I claim, 1st, In combination with the wheels, B, the intermediately placed brakes, C C, connected by a toggle joint, D D, and beam, E, suspended upon the slotted hangers, F, and so arranged in relation to the track that when the cars are thrown from the track, the weight of the car shall be applied to press the brakes against the wheels, substantially as set forth.

2d, The combination of the beams, E and F', arms, G and H, spring, G, lever, I, spring, K, and pin, K1, for automatically disconnecting a car when thrown from the track, substantially in the manner set forth.

3d, The combination of the draw bar, L, jaw, M, spring, K, and pin, K1, and arm, K2, arranged to operate substantially as and for the purpose set forth.

76,716.—LAMP BURNER.—Henry Coulter, Philadelphia, Pa.

I claim springs, h h h, so constructed and connected to a lamp chimney holder as to retain upon the same either a swelled or a cylindrical chimney, as specified.

76,717.—VENTILATOR.—R. T. Crane, Chicago, Ill.

I claim, 1st, The cold-air pipe, B, in combination with the hot-air pipe, A, substantially as and for the purposes specified.

2d, The air pipe, B, in combination with the pipe, A, and register, C, substantially as and for the purposes specified.

3d, Providing the hot and cold-air flues, A B, with a register, so constructed and operated that when one flue is closed, or partially closed, the other will be correspondingly opened, substantially as and for the purposes specified.

4th, The deflector, E, in combination with the register, C, constructed and operating substantially as and for the purposes specified.

5th, The deflector, E, constructed and operating substantially as and for the purposes specified.

76,718.—VENTILATOR.—R. T. Crane, Chicago, Ill.

I claim the projection and opening, B, provided with the netting, g, and curtains or valves, b, in combination with the pipe, A, substantially as and for the purposes specified.

76,719.—INKSTAND.—Samuel Darling and John E. Hall, Bangor, Me.

We claim, 1st, A swinging pen rack, so combined with the cover of an inkstand that the movement of the rack will operate the cover.

2d, The combination, with an inkstand and its cover, of a pen rack, or its equivalent, in such manner that the mere weight of the penholder, when laid down by the writer, shall cause the ink to be covered, and that the ink shall be uncovered when the pen is taken up.

76,720.—HEMMER.—E. P. Davis, North Attleboro, Mass.

I claim the combination of the plates, b and c, formed as shown and described, with the arm, A, as and for the purposes set forth.

76,721.—SHINGLE MACHINE.—J. P. N. Davis, Point Arena, Cal.

I claim, 1st, The combination and arrangement of the clamps, H H, for holding the shingle, the curved pivoted knives, I I, and the wedge, b, for graduating the distance between the edges of the same for tapering the shingles, substantially as described.

2d, The combination and arrangement of the rod, K, and lever, M, for releasing and delivering the finished shingles, substantially as described.

3d, The double delivery trough, L, divided by the vibrating diaphragm, g, in combination with the cam, S, arms, T and U, and pin, d, for operating the same, substantially as described.

4th, The bar or rod, I, in combination with the vibrating diaphragm, g, for reversing every alternated shingle on its way to the packing box, substantially as described.

5th, The sliding packing box having movable partitions, in combination with the inclines, m m, levers, n and r, latch, t, and spring, z, for operating the same, substantially as described.

76,722.—PRINTERS' CHASE.—Robert Dick, Buffalo, N. Y.

I claim, 1st, The construction and use of a sufficient number of suitably inclined planes, formed along the side and foot of otherwise common chases, employed in combination with thin wedges of any suitable substance, operating between these inclined planes and a regiet of suitable material, so as to lock up a forro in an eighth of an inch chase room as easily and as efficiently as in two inches of chase room, all constructed and operating in combination substantially as set forth.

2d, The flanged coin or wedge, constructed and operated substantially as set forth.

76,723.—SHUTTER FASTENING.—Bartlett Doe, Boston, Mass.

I claim, 1st, The manner of uniting the two halves of the cylindrical case, by means of a ligature applied between the ends of the shell, and at a place of less diameter than said ends, substantially as described.

2d, Also giving to the lower part of the case the rounded and depressed form shown and described, for the purpose of shedding the rain, as described.

3d, Also constructing the upper half of the shell with the opening, f, substantially as and for the purpose set forth.

76,724.—THREAD WINDING MACHINE.—Frederick C. Ehrenberg and Theodor Ehrenberg, New York city.

We claim, 1st, The eccentric roller, X, with corrugations or teeth on its periphery, in combination with spool frame, S, substantially as described.

2d, The eccentric roller, X, and its finger, Z, in combination with the stops, Y Y', substantially as described.

76,725.—TABLE LEAF SUPPORT.—Samuel Ehrman, Chicago, Ill.

I claim the arrangement of the plate, C, with its drop latch, D, and slot, E, in combination with the curved arm, A, when provided with a hinge, B, at one end, and notch or shoulder, a, at the other, operating and constructed in the manner and for the purpose specified.

76,726.—CONCRETE BRICK MACHINE.—William Emmons, Sandwich, Ill.

I claim the lid, E, arranged with a lug, P, and to swing on a bolt, C, in combination with lugs, D D D S, and mold, I I, as and for the purpose set forth.

76,727.—HINGE FOR GATES AND DOORS.—D. S. Esten, Monson, Mass. Antedated April 9, 1868.

I claim the upper part, D, provided with a pendent rod, E, passing loosely through the lower part, C, and surrounded by a spiral spring, F, fitting against the under side of the part, C, and held upon the rod, E, by the nut, G, said parts, C D, provided with inclined surfaces and shoulders, a b, substantially as and for the purpose specified.

76,728.—CONSTRUCTION OF EARS FOR CAN AND KETTLE BAILS.—Thomas Evans, Newark, N. Y.

I claim the ear for the bail of cans or kettles formed with corrugations, as and for the purposes set forth.

76,729.—TUBE CUTTER.—John De Galleford, Cohoes, assignor to himself and Wm. E. Marston, Troy, N. Y.

I claim, 1st, A pipe cutter consisting of the C-shaped frame, A, with its rollers, h h, of the screw, B, adjustable block, C, with its rollers, f f, of the spring, D, and cutting tool, E, all made and operating substantially as herein shown and described.

2d, The grooved rollers, f f, when arranged as described, so that they not only serve as supports for the pipe, but also as guides for the cutter, substantially as herein shown and described.

3d, The block, C, when provided with the spring, D, against which the screw, B, shuts, and when fitted loosely around the cutter, E, substantially as described, so that it can yield to projections on the pipe without influencing the position of the cutter, arranged as set forth.

76,730.—SCROLL SAW MILL.—Bernard Demming, Cleveland, Ohio.

I claim, 1st, The frame, H, pivoted at h, and having projecting bolts or pins, c1', working respectively in slots, g f, whereby the frame may be fixed at any required inclination, substantially as specified.

2d, The combination of the saw, S, with the lever, o, and slide, m, the lever being pivoted to the slide, and its inclination being adjustable by means of a pin, p, and nut, a, or some equivalent device, so that, by inclining the lever at different angles to the slide the saw may be caused to rake more or less, substantially as described.

76,731.—OVERSHOE.—Lewis Elliott, Jr. (assignor to L. Candee & Co.), New Haven, Conn.

I claim an overshoe formed from india rubber in the usual manner, and provided with a fabricated upper, A, when the said upper is applied thereto in the manner herein set forth.

76,732.—HYDRAULIC PRESS.—William Ettinger and Horace P. Edmond, Richmond, Va.

We claim, 1st, The placing of the cylinder of the hydraulic press immediately under the head piece or cross beam of the frame of the press, the head piece or cross beam resting directly on the piston.

2d, The retainer, H, formed with two sets of horizontal steps, 1 2 3 4, and sustained and operated substantially as and for the purpose set forth.

76,733.—WOOD LATHE.—Geo. W. Feltes, Carbondale, Ill.

I claim in connection with the two models, L L, arranged and operated as described, the arrangement of a series of revolving shafts, E E', each bearing two cutting instruments, one at each end of the shaft, the shafts being held in a sliding frame which allows the cutters on one end of the series to operate upon a series of sticks parallel to the model, while those on the other end of the series operate on another series of sticks parallel to the other model, whereby any number of spokes, M M M M, may be made simultaneously in a single machine.

76,734.—GRATE BAR.—Addison C. Fletcher, M.D., New York city. Antedated April 3, 1868.

I claim, 1st, A grate bar having cast to or forming part of it, in the rear, a perforated cylinder, C, having an annular projection on one side, and a corresponding recess on the other, the axial line of which cylinder is arranged transversely to the length of the bar, the same forming, in connection with the other bars of like construction, a tubular perforated bridge for the passage of heated air to the fire, substantially as specified.

2d, The application to a grate bar, constructed substantially as described, of a longitudinal tubular portion, A, terminating in a transverse cylindrical perforated structure, C, of bridge like character, and made to form part of the grate bar of an outside lid or valve, B, essentially as and for the purpose or purposes herein set forth.

76,735.—GANG PLOW.—Matthew Finn, St. Louis, Mo.

I claim, 1st, The sliding blocks, c, connecting rods, c1, and sectors, c2, when arranged and employed substantially as herein shown and described, for the purpose of transmitting the draft from the axle to the plows.

2d, The sectors or sector, D, pinion, d, and beams, B', when combined and arranged as herein shown and described.

3d, The hook, d2, and lever, d3, when combined with the beam, B', and sector, D, as described and shown.

76,736.—DOUBLE SHOVEL PLOW.—I. G. Flisher and E. M. Bates, Stark county, Ohio.

We claim, 1st, The adjustable sole, D E, constructed and arranged substantially as and for the purpose set forth.

2d, In combination with the adjustable sole, D E, the slide, g, and the nuts, f h, arranged and operating substantially as and for the purpose described.

3d, The cutters or knives, a a, when used in combination with the shovel, c, substantially as and for the purpose described.

76,737.—DRAFT BAR.—Daniel Foreman and Michael Foreman, Dalton, Ohio.

We claim constructing the draft bar in two equal parts, and so hinging said parts as to leave a space between them, when the same is used in combination with spring, C, staple, d, and clevis, e, all arranged substantially as and for the purpose set forth.

76,738.—CORN PLANTER AND PLOW.—J. H. Frampton, Hopewell, Ohio.

I claim, 1st, The handle, D, composed of two pieces, d d1, hinged together at d2, when used for the purposes set forth.

2d, The combination of the hinged handle, D, with the rod, n, lever, l, and sliding bottom, m, of the seed box, I, when operating substantially as and for the purposes set forth.

76,739.—SHIPPER FOR SHIFTING BELTS.—Thomas W. Frost, Dorchester, assignor to himself and J. B. Kendall, Milton, Mass.

I claim the within described guide, N, formed in one or more pieces, and secured to a sliding bar, M, for giving the belt a latteral inclination, as and for the purpose set forth.

76,740.—WOOD PLANING MACHINE.—O. P. Furman, Addison, N. Y.

I claim the slide G, having inclined ways upon its sides, working vertically in inclined grooves in the sides of the slide, F, in combination with the crank shaft, H, and lever, b, all constructed and operating as herein described, for the purpose specified.

76,741.—ADJUSTABLE SCROLL INDEX FOR GEAR CUTTING MACHINE.—Wm. M. Gainsha, Arlington, Vt., assignor to himself and N. H. Batcheller.

I claim, 1st, An index for gear cutting and other spacing machines, consisting of the perforated or marked plate, C, moving on a scroll track, which is provided on the face of the disk, substantially as herein shown and described.

2d, The slotted clamps, D D, when fitted to bolts, b b, which move in a groove, d, as set forth, in combination with the plate, C, as specified.

3d, The index plate, E, when provided with the fixed stop, e, and with the movable stop, F, and when combined with the disk, A, and scroll plate, C, all made and operating substantially as herein shown and described.

76,742.—MOSAIC FLOOR.—G. G. Garibaldi, Buffalo, N. Y.

I claim, 1st, A composition for mosaic work, substantially as herein described.

2d, A mosaic floor, ceiling, or wall, made of the composition, and in the manner substantially as herein described.

76,743.—HAY RAKER AND LOADER.—Geo. B. Garlinghouse and J. C. Moore, Madison, Ind.

We claim, 1st, The contracting apron, when constructed to operate substantially as described and for the purpose set forth.

2d, The guard formed of the bar, K, and fingers, h h h h, when used in the manner and for the purpose as described.

3d, In combination with the above, the mode of lifting the rake and holding it up, in the manner substantially as shown and described.

4th, In combination with the first clause, the wheels, H H' H'', auxilliary wheels, J J and teeth, 11, etc., or their equivalents, when used substantially in the manner and for the purpose as set forth.

76,744.—HOPPER ATTACHMENT FOR WAGONS.—Frank Gerard, Lincoln, Ill.

I claim, 1st, The combination of the hopper, B, formed with sideboards, e, with the wagon box, A, substantially as and for the purpose specified.

2d, The arrangement of the transeverse bar, b, with reference to the rear end of the box, A, and the edge or end, c, of the hopper, substantially as and for the purpose specified.

3d, The arrangement of the hasps, r, staples, r', and hooks, r*, with reference to each other and with the triangular side pieces, e, of the hopper, B, and the box, A, substantially as and for the purpose specified.

76,745.—FIELD FENCE.—J. A. Gromly, Bucyrus, Ohio.

I claim, 1st, The loop, d, when the same is constructed and applied substantially as described.

2d, The combination of the anchor, A, post, B, board, D, and loop, d, when the same are constructed and arranged substantially as described.

76,746.—DETACHABLE COVERING FOR BUTTONS.—Francis H. Gould, Newark, N. J.

I claim a cap, B, provided with a suitable fastening, whereby said cap can be readily attached to or detached from a button, substantially as set forth.

76,747.—HOSPITAL BED.—Edward Gray, Cuyahoga Falls, O.

I claim, 1st, The side rails, A1, with grooves, a, caps, a2 a3, in combination with springs, a1, and bed frame, B1 B2 B3, as and for the purpose set forth.

2d, The bed frame, with parts, B1 B3, having rollers, x x, in combination with part B2, having flat slats, substantially as and for the purpose described.

3d, The middle part, B2, of the bed frame, constructed as described, in combination with rod, b3, arranged as described, as and for the purpose set forth.

4th, The table, S, with the rods, s, in combination with ears, s', and rod, S, substantially as described.

5th, The shaft, C1, with frames; C3 C4, when combined and arranged so as to operate the head piece, B1, or middle part, B2, of the bed frame, or both, in the manner and for the purpose described.

76,748.—TELEGRAPHIC APPARATUS.—Elisha Gray, Cleveland, Ohio.

I claim, 1st, Operating a relay by two-and-fro currents of magneto-electricity, momentarily induced by a disturbance of the main or line current, in the manner substantially as described.

2d, In combination with the receiving magnet or magnets, the electro-magnetic armature, in which a secondary current is induced on the disturbance of the line current, substantially as described.

3d, In combination with the induction apparatus, constructed as described, the polarized relay, placed in a short circuit, and operated by induced currents, in the manner and for the purpose as set forth.

4th, The arrangement of the magnets, B C and B' C', in combination with the magnets, D' D', used in the manner and for the purposes substantially as described.

76,749.—APPARATUS FOR TREATING MILK.—Geo. D. Greenleaf and Darius C. Larkins, Depaulville, N. Y.

We claim, 1st, The cooling pipes B, adjusted in the pan or vat, A, by means of the chains, D, and pins, E, as herein described, for the purpose specified.

2d, The combination and arrangement of the adjustable pipes, B, having central turned-up end, B1, and siphon, B2, the handles, C, and vat, A, as herein described, for the purpose specified.

76,750.—FIREPLACE.—C. B. Gregory, Beverly, N. Y.

I claim the air chambers, m and n, situated between the inner perforated casing, B, and outer casing, A, of a fireplace, and communicating with chambers containing gravel or other suitable granulated material, through which the air must pass prior to entering the firepot, all substantially as and for the purpose herein set forth.

76,751.—FIREPLACE.—W. D. Guseman, Morgantown, W. Va.

I claim, 1st, The projecting front or cap, C, above and beyond the perpendicular line of the front of the grate, substantially as and for the purpose specified.

2d, The sliding blower or screen, E, in combination with the projecting front or cap, C, substantially as and for the purpose set forth.

76,752.—POST-HOLE BORING MACHINE.—W. I. Hale (assignor to himself and W. M. Logan), Ashley, Ill.

I claim the body A, spurs, c, plunger, F, guides, G, and cross head, H, when constructed, arranged, and combined as and for the purpose specified.

76,753.—ATMOSPHERIC CHURN.—Don C. Hall, Hannibal, Mo.

I claim, 1st, The combination of the removable pipes, L, cylinders, C, one or both, pistons, D, lever, F, and supply pipes, H, having valves, I, placed in them, with each other and with the churn A B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the removable pipes, L, cylinders, C, supply pipes, H, having valves, I, placed within them, and flexible pipe or hose, K, with each other, whether used with or without the interposition of the branched pipe, J, substantially as herein shown and described and for the purpose set forth.

76,754.—SADIRON.—Judson W. Hall, Worcester, Mass.

I claim, 1st, The combination with the rear of the iron, of the concavities, m m, for the purposes stated.

2d, The combinaton with the rear of the iron, of window, e, substantially as and for the purposes set forth.

76,755.—MACHINE FOR POLISHING WOOD.—G. F. Hammer, Cincinnati, Ohio.

I claim the revolving vertical spindle, b, drum, E, the pulleys, B C, belted together, in combination with the cross head, g, connecting rod, f, crank, e, spur-wheel, d, and worm gear, c, upon shaft, a, all arranged to operate as described.

76,756.—CLOTHES DRYER.—Henry J. Hancock, N. Y. city.

I claim, 1st, The combination of the pivoted frame, B, carrying the laterally extending arms or bars, C, with the bracket, b, on the shaft or rod, A, whereby the arms or bars, when closed together may be brought into nearly or quite vertical position, substantially as herein set forth.

2d, The combination of the clasping device, D, with the supporting rod or shaft, A, and the movable arms or bars, C, whereby the latter, when closed and turned into an upright position, may be retained in such position, substantially as herein set forth.

3d, The arrangement of the laterally extending bracing arms, g g*, upon the clasping device, D, and the bracket, b, of the pivoted frame, B, and with reference to the rod or shaft, A, whereby the apparatus is prevented from turning upon the axis of the shaft, substantially as herein set forth.

76,757.—MODE OF PURIFYING, SEASONING AND PRESERVING WOOD.—Theodore Wm. Heinemann, New York city.

I claim, 1st, The method herein described of purifying, seasoning and preserving wood by first freeing it from substances liable to spontaneous decay, in the manner described, and afterwards impregnating it with any of the substances herein specified, or their equivalents, by means of high steam pressure, substantially as described.

2d, The method herein described of impregnating wood with any of the substances specified, or their equivalents, by means of high steam pressure, when the steam is generated and superheated in the same boiler or retort in which the wood and impregnating substances are combined, and subjected to steam pressure, substantially as set forth.

76,758.—HORSE HAY FORK.—Samuel M. Hoagland, Catawissa, Pa., assignor to Daniel Kostenbander.

I claim the rod d, and spring, E, substantially as shown and described, in combination with the handles, B, of a double-tined hay fork, all as and for the purpose set forth.

76,759.—REED ORGAN.—Frederick Hoddick (assignor to Geo. A. Prince), Buffalo, N. Y.

I claim, 1st, The employment in upright organs of the chambers, B B, interposed between the sets of reeds and the valves, and operating in the manner and for the purpose set forth.

2d, So combining several sets of reeds, E E, with the chambers, B B, that the opening of the one valve, C, in any one chamber, shall act upon all the reeds opening in that chamber, as herein set forth.

3d, Arranging the valves, C C, and the openings, D D, which they cover, in two rows, one above the other, and alternating in position, when combined with the chambers, B B, in such a manner as to economize space, as herein set forth.

76,760.—HORSE RAKE.—Cyrus P. Holden, Worcester, Mass.

I claim, 1st, The tubular head, C, composed of two parts, connected by the yoke, b, in combination with the axle, A, the ratchet, c, and pawl, d, substantially as and for the purpose specified.

2d, The arrangement and combination of the hook, f, and yoke, b, with the tubular head, C, and its teeth, C*, substantially as shown and described, for the purpose set forth.

3d, The tubular head, C, arranged eccentrically upon the axle, A, in such manner as to permit the innermost ends of the teeth, C*, to be passed thro' such tubular head without interfering with the axle, substantially as and for the purpose specified.

76,761.—ICE PITCHER.—Robert Holmes (assignor to Middletown Plate Company), Middletown, Conn.

I claim, 1st, The providing of the bottom of the internal wall, F, with a pendent pin, c, to fit into a step, d, at the center of the upper edge of the base, E, substantially in the manner as and for the purpose herein set forth.

2d, The connecting of the detachable base, E, with the external wall, A, by means of a screw joint, a, when said detachable base is used in connection with the step, d, and the pendent pin, c, at the bottom of the inner wall, substantially as set forth.

76,762.—COACH PAD.—Benj. F. Hooper, Newark, N. J.

I claim the metal sides, b, and body piece, d, constructed and arranged substantially as herein shown and described.

76,763.—METHOD OF PREPARING ACID PHOSPHATE OF LIME.

Eben N. Horsford, Cambridge, Mass.

I claim the use of sulphuric acid or oil of vitriol of commerce, purified as above described, to be employed in the manufacture of pulverulent acid phosphate of lime, when such acid phosphate is so manufactured as to contain gypsum or sulphate of lime derived from the phosphate of lime used in making said pulverulent acid phosphate for the purpose of raising bread.

76,764.—LAMP.—Mark W. House, Cleveland, Ohio.

I claim the adapter, B, in combination with the tube, D E, substantially as arranged and described for the purpose set forth.

76,765.—COMPOSITION FOR BILLIARD BALLS AND OTHER ARTICLES.—John W. Hyatt, Jr., Albany, N. Y.

I claim, 1st, My improved method of producing such mixture by first pulverizing the gum, as above described, and then mixing the same with paper pulp, in the manner and for the purpose above described.

2d, I claim the billiard ball, or other article of manufacture, produced from such composition, substantially in the manner and for the purpose above described.

76,766.—MANUFACTURE OF GLASS KNOBS.—E. D. Ives, New Haven, Conn.

I claim a glass knob attached to its socket, shank or whatever it may be, and completed by giving to the said knob a fire surface finish, substantially in the manner set forth.

76,767.—LANTERN.—Allen S. Jackson (assignor to himself and John F. Myers), Kokomo, Ind.

I claim, 1st, In combination with the base and burner of the lamp the flange plate, B', perforated annular plate, F, and annular plate, G, attached thereto at G', arranged to operate substantially as and for the purpose set forth.

2d, A lantern combining in its construction the following elements: A base and lamp, a flange plate, B', perforated annular plate, F, deflecting annular plate, G, ring, G', chimney, L, detachable frame, H H', and top, I, said parts being respectively constructed and arranged in relation to each other, substantially as described.

76,768.—CAR REPLACER.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim, 1st, The combination of the two inclines, M N, when constructed with cars, m m, n n, on each side, so that they can be applied on either side of the rail, substantially as and for the purposes specified.

2d, In an apparatus consisting of the grooved incline, M, and the smooth incline, N, so constructing the groove, O, that it receives the flange of the car wheel at the lower and expanded end of the groove and guides it gradually toward the rail, finally dropping the wheel upon the rail in the manner described, and without causing the wheel to cross the rail.

76,769.—STEAM ENGINE VALVE GEAR.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim, 1st, The combination of the slides, M M, blocks, m m N, lever, J, valve stem, I, and cross head, C', when the said parts are constructed and arranged so as to operate the valve gear from the cross head, substantially as described.

2d, The arrangement of the springs, s s, with the blocks, m and N, substantially as specified.

76,770.—ROTARY STEAM ENGINE.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim the arrangement of the regulating screw, F, spring brace, G, movable abutment, D, and guides, M M, operating in connection with a rotary cylinder, A, in the manner described.

76,771.—PAPER CASK.—John W. Jarboe, Green Point, N. Y.

I claim a cask or vessel of a similar nature, made of paper, having it s head or heads supported by an outer casing, c, and secured to the cylinder or body, substantially as shown and described.

76,772.—DEVICE FOR CLOSING THE MOUTHS OF JARS, CANS, ETC.—Edward T. Jenkins, Ravenswood, N. Y. Antedated April 7, 1868.

I claim the combination of the plates, A and D, screw, B, washer, C, and pin, E, for the purpose specified.

76,773.—COMPOUND FOR ROOFING AND OTHER PURPOSES.—Henry W. Johns, New York city.

I claim the combination of asbestos with pigments, oleaginous or resinous matters, or varnishes, or spirits, or ground or powdered minerals, or rubber all substantially as described and for the general purposes set forth.

76,774.—LUBRICATOR.—Erastus Johnson, Wilkins, Pa.

I claim the combination of the valve stem, D, having the head, m, with the neck, I, and stopple, E, having the jaws, e e, all constructed and combined substantially as and for the purpose set forth.

76,775.—APPARATUS FOR MAKING EXTRACTS FROM BARK AND OTHER MATERIALS.—James W. Jones, Cumberland, Md.

I claim, 1st, Introducing at the bottom of a vat, leach tub, or other vessel, a column of water or liquid of any desirable altitude, to increase the force of the upward hydraulic pressure, when the liquid is drawn off at the bottom, substantially as and for the purpose specified.

2d, The combination and arrangement of the vats, leach tubs and other vessels with the troughs or pipes, G and H, and reservoirs, G' and H', substantially as and for the purpose specified.

3d, The combination and arrangement of the leaches, tank, and hose or pipes, when the same are constructed and arranged substantially as described.

4th, The combination and arrangement of the leaches, reservoirs, pump, or pipes, when the same are constructed and arranged substantially as described.

76,776.—SLIDE VALVE OF COMBINED HIGH AND LOW PRESSURE ENGINE.—Thomas L. Jones, Natchez, Miss.

I claim the arrangement of the steam ports, a a1 a2 a3, condenser ports, e e', exhausts, i i', valves, g g', and valve, c c1 c2, when the parts referred to are constructed so as to operate substantially as and for the purposes set forth.

76,777.—MACHINE FOR TANNING.—Lewis L. Kelley, Delaware Station, Ind.

I claim the arrangement of the wheel or rack, E F, having a reciprocating or partial rotation within a tanner's vat, as and for the purpose set forth.

76,778.—DRAIN AND WATER PIPE.—Wm. P. Kirkland, San Francisco, Cal., assignor to himself, J. L. Murphy and Edgar W. Murphy.

I claim in the manufacture of drain and water pipes, the use of ropes, cords or strands, dipped in a pitchy or tarry substance, and wound spirally or placed at right angles around a form, for the purpose of obtaining the desired shape and thickness of the pipe.

Also, the use of a filling of oakum or other fibrous material, placed under the strand or cords, substantially as described for the purposes set forth.

76,779.—STOVEPIPE DRUM.—Dallas Knowlton, Liberty, Me.

I claim the combination and arrangement of the partitions, f g h, with the disk, D, and the drum or case, A, its induct, B, educt, C, and plates, c c', the whole being to operate substantially as specified.

Also, the combination and arrangement of the damper, E, with the partitions, f g h, the disk, D, case, A, induct, B, educt, C, and plates, c c', arranged substantially in the manner and so as to operate as set forth.

76,780.—PADLOCK.—Jacob E. Kohout, Brooklyn, N. Y.

I claim, 1st, The stop, K, and spring, L, for preventing retrogade moveme of the key.

2d, In combination therewith I claim the sliding bolts M, and shackle sprin R, all operating together substantially as and for the purposes described an set forth.

76,781.—MACHINE FOR STRAIGHTENING AND ROUNDING SHAFTING.—Frederick H. Laforge and Wm. Geddes, Waterbury, Ct.

We claim, 1st, The obliquely arranged feed rolls, in combination with the pressure rollers, substantially as and for the purpose specified.

2d, The combination of the guide rolls, C, the pressure rollers, B, and the obliquely arranged feed rolls, a' b' c', provided with their respective means of adjustment, all arranged and operating substantially as set forth.

3d, The construction of the pressure rollers and supporting rolls, with beveled or tapering end portions, m m', arranged in relation with the mechanism, which feeds the shaft or rod to the pressure roller, substantially as and for the purpose specified.

76,782.—SHINGLE MACHINE.—Patrick H. Lawler, Rochester, N. Y.

I claim the arrangement of the pawl, I, star wheel, K, spur wheel, W, pinion, P, and its shaft, S, in combination with the crank, C, or its equivalent, and slotted piece, N, operating substantially for the purposes and in the manner herein described.

76,783.—WOVEN FABRIC FOR FLOOR MATTING, ETC.—Isaac Lindsley, Pawtucket, R. I.

I claim, 1st, The method herein described of preparing and assorting straw for weft of, and weaving the same into a fabric.

2d, The woven fabric herein described, composed of a weft of straw, prepared, sorted, woven and finished, as set forth.

3d, The mode herein described of forming the selvedge of a woven fabric, by securing the ends of the weft by one or more rows or courses of machine stitching, as set forth.

76,784.—REVOLVING CYLINDER FOR TANNING HIDES.—Jos. W. Lull, Glen Hope, Pa.

I claim, 1st, The tanning of leather by means of a revolving cylinder, substantially as described.

2d, The cylinder, A, constructed with the heads, D D, perforated interior head, C, boops, G G, fastened by coupling, H, door, F, and projecting pins, e e, substantially as and for the purpose set forth.

76,785.—BED BOTTOM.—J. I Mabbett, Titusville, Pa.

I claim the combination of the slats, h h, constructed as described, and their bands, g g, with the movable arms, D D, cross slats, J J, levers, C C, having pulleys at their tops, cords, f f, and winding shaft, d, the several parts being constructed, arranged and used as specified.

76,784.—MATCH BOX.—Alexander Martin, Basel, assignor to himself and George Ott, Schaffhausen, Switzerland.

I claim the application of the described metal grate to match boxes or walls or any articles whatsoever, for the purpose of lighting friction matches.

76,787.—HORSE HAY FORK.—Anthony M. Martin and John C. Blocher, Bloomville, Ohio.

I claim the horse hay fork constructed as described, having its central tines bent upward, in rear of the bar, J, to receive the end of the pivoted lever, L, bearing the roller, d, said roller adapted to fit under the lower end of the curved slotted brace, B, when the fork is loaded, and withdrawn therefrom to permit the brace to slide by its slot, e, upon the rod, m, in said lever, to discharge the load, as herein shown and described.

76,788.—DITCHING MACHINE.—John Masters, Waukegan, Ill.

I claim, 1st, The pivoted plow, I, when constructed and arranged so as to be adjustable in a horizontal position upon the elevator box, D, at whatever depth in the ground it may be operating, in combination with the elevator box, D, as herein described.

2d, The plow, I, when constsucted with two land sides, i i, the concave double mold board, i, the curved cutting edge, i'', and the arms, I' I'', substantially as and for the purpose specified.

3d, The wheel, W, rendered adjustable in the manner herein described, when arranged so as to operate in combination with and at the plow point, substantially as and for the purpose specified.

76,789.—GAS REFLECTOR.—Wm. J. McLea (assignor to himself and C. F. Young), Buffalo, N. Y.

I claim the combination of the gas chamber, A, the rod, a, the slide, C, the sliding rod, c, the reflectors, D, and the rubber gas tubes, m, constructed, arranged and operating substantially as and for the purposes herein described.

76,790.—DOOR.—G. M. McMahan, Mount Sterling, Ky.

I claim the combination of the door, D, rods, C R, gearing, w s, arm, a, and spring, m, with the platform, B', posts, n n, hollow supports c e, springs, u u, arched beams, l l, and pin, p, when the said parts are constructed and arranged so as to operate in connection with each other, substantially in the manner and for the purposes set forth.

76,791.—WOOD PLANING MACHINE.—Rufus N. Meriam, Worcester, Mass.

I claim, 1st, The slots, w, in the bed, A, arranged beneath the cutter head, F, to permit the escape of the chips or shavings, substantially as herein set forth.

2d, The arrangement of one or more presser blocks, D* E*, in relation with the molding cutter and one or more side cutters, J, substantially as shown and described, and for the purpose specified

3d, The curved end portions, b, of the springs, B, arranged to act upon the sliding bearings of the feed rollers, substantially as shown and described and for the purpose specified.

4th, The presser plate, D, formed with a stem, r, and spiral spring, s, arranged in the sleeve, n, and made adjustable upon the slotted bar, C, substantially as and for the purpose specified.

5th, The presser block, E*, constructed with a detachable bearing piece, whose under surface is the reverse of the surface of the molding, and made adjustable vertically and laterally, substantially as herein shown and set forth.

6th, The slide, K*, in combination with the slotted bar, L, screw, b**, and pivoted frame, K, all constructed and operating in connection with the slotted bar, r, to admit of an angular adjustment of the side cutters, J, substantially as set forth.

76,792.—INKSTAND.—George Merritt, Brooklyn, N. Y.

I claim, 1st, the filter plug, M, in combination with the funnel, A1, and with the jump, H, arranged to operate substantially as and for the purpose herein set forth.

2d, The duplicate collars, C D, threaded, the one male and the other female as shown, and arranged relatively to each other and the neck of the orifice, A2, and to the jump, H, or equivalent means of raising and lowering the pressure of the air in the inkstand, substantially as and for the purposes herein specified.

3d, The pen rack, P P1 P2, arranged to lock by its elasticity upon the main body of the inkstand, and to form a hinge for the cover, R, substantially as herein set forth.

76,793.—WEATHER STRIP.—J. R. Mills, Macon City, Mo.

I claim in combination with a weather strip placed underneath a door, and having in its upper surface a groove extending the full width of the doorway and increasing in depth from one side of the doorway to the other, and having a notch or spout in the outer ledge of the groove, at the deepest end, for the purpose of letting the water outward, the elastic band, E, made of rubber or other material and applied to the bottom of the door in such a way as that when the door is shut the free edge of the band shall extend down into the edge of the groove, in the manner and for the purpose specified.

76,794.—HEEL CASING.—John R. Moffitt, Chelser, Mass.

I claim a heel casing, formed of sheet metal, substantially as described.

Also, in combination with a metal heel casing, spurs, o, substantially as and for the purpose set forth.

76,795.—METAL BEAM.—Richard Montgomery, N. Y. city.

I claim, 1st, So shaping and forming the ends of an arch constructed of corrugated metal as that said ends shall coincide with the straight ends of a beam forming a chord to said arch, if superimposed thereon, substantially in the manner herein set forth.

2d, Imparting a curved or irregular line to the folds of a corrugated metal beam, substantially in the manner and for the purpose herein specified.

3d, Indenting or breaking the surface of the folds or corrugations in a corrugated metal beam, substantially as and for the purpose herein set forth.

4th, A bolt, E, having a forded shank, so arranged and disposed as to fit within and between the folds of a corrugated metal beam, at the ends thereof, substantially in the manner and for the purpose herein set forth.

76,796.—WORK STAND.—I. Morris, Clinton, Ill.

I claim, 1st, The groove and socket of the standard, D, in combination with the deflected bars, d d', of the knives, E, substantially as and for the purpose set forth.

2d, The spool spindles, a a, twine box, A B, pin cushion, C, and knives, E, combined, arranged, and operating substantially as set forth.

76,797.—METHOD OF MAKING RINGS FOR RING SPINNING.—Cyrus B. Morse, Rhinebeck, N. Y.

I claim, 1st, As a new method in the manufacture rings, for ring and traveler spinning, forming a finished ring on the end of metal tubes, and then severing the same from the tube itself, as herein described.

2d, Making rings, for ring and traveler spinning, of highly carbonized cast steel, and hardening or tempering at a low heat only the wearing portion or parts of the same, as herein described.

76,798.—SPINNING FRAME.—C. B. Morse, Rhinebeck, N. Y.

I claim the tubular lifting rod support, E, in combination with the slotted bolster and step rails, A B, and with the lifting rail, C, for the purpose of adjusting said lifting rail to and from the center of the machine, substantially as herein set forth.

76,799.—WINDOW BLIND FASTENER.—David B. Mosher and Charles C. Mosher, Seneca Falls, N. Y.

We claim the combination of the shaft and gear, B, gear, with arm attached, C, box or frame, D, link, E, dog, F, rose, G, knob or handle, H, when made substantially as specified, and applied as herein set forth.

76,800.—GATE.—E. M. Naramore, North Underhill, Vt.

I claim, 1st, The spring, J, applied to a pivot gate, and in combination therewith, substantially as and for the purpose described.

2d, In combination with the pivot gate and spring, J, the catch, K, substantially as described for the purposes set forth.

76,801.—HIGH CHAIR FOR CHILDREN.—John Nichols, Gardner, Mass.

I claim the child's high chair constructed as described, having the divided legs removably hinged together, the lower part, D, of which, carrying the box, G, is adapted to be folded up in front of the chair seat, as herein described for the purpose specified.

76,802.—CAP FOR OIL CAN.—Josiah N. Noyes, Center Abington, Mass.

I claim, 1st, The construction of the revolving perforated cap, in combination with the neck of the can or other vessel, substantially as herein shown and described.

2d, The combination of the sealing packing, E, with the cap and the diaphragm, a, substantially as herein shown and described.

3d, The slotted flange, D, in combination with the stop pin, g, as and for the purpose set forth.

76,803.—INDICATOR FOR THE SPRINGING OR BENDING OF RAILWAY AXLES.—Lewis E. Osborn, New Haven, Conn.

I claim, 1st, The lever, C, placed upon the truck acted on by the flange, b, and connected with the pointer, d, to indicate in the manner and for the purpose specified.

2d, The band or ring, D, placed upon the axle, upon which the said axle acts as an eccentric or cam, and connected with the pointer, d, to indicate in the manner and for the purpose herein specified.

3d, The combination of the dial, A, levers, C C, and rings, D D, as a double-acting indicator, in the manner and for the purpose specified.

76,804.—HOLLOW AUGER.—J. L. Parker, Harrisonburg, Va.

I claim the combination in one instrument of the two adjustable dogs, D D, the cutting instruments, G G', when constructed and arranged together as described, the clamp, F, the stop, S, adjustable by means of the set screw, s, the bifurcated stock, A, and the solid head, B, provided with the central opening, O, and the raised bed, C, in which the blades are countersunk, all the said parts being constructed and arranged and operating together substantially in the manner and for the purposes set forth.

76,805.—BREECH-LOADING FIRE-ARM.—Henry O. Peabody (assignor to the Providence Tool Company), Providence, R. I.

I claim, in combination with the breech block, A (operated as described in the reissue Letters Patent granted to me March 13, 1866), a central and rimfiring needle, b B, constructed and arranged substantially as described.

76,806.—CEMENT FOR COATING WOOD, ETC.—Antonio Pelletier, Washington, D. C.

I claim, 1st, The compound, consisting of vegetable fiber, sand or pulverized silicious limestone, caustic or carbonate of lime, Portland cement, oxide of zinc, chloride of zinc, without or with the additional use of silicate of soda, substantially as described and set forth.

2d, As substitutes for oxide and chloride of zinc, equivalent metallic salts, substantially as described and set forth.

3d, As substitutes for Portland cement, or hydraulic cement, the addition of aluminous salts, mineral, and slags, together with oyster shells, gas house lime, dolomite, or similar magnesian limestones, substantially as described and set forth.

4th, As a new article of manufacture, the composition, substantially as herein described and for the purposes set forth.

76,807.—SEWING MACHINE.—T. W. Pepper, New York city.

I claim, 1st, The combination of the sliding clutch, T, with its cams or cam formations, levers, N O, and rod, h, with its feeder, I, for operation in concert with a presser foot, I, as herein set forth.

2d, The combination of the reciprocating shuttle, K, with the feeder, I, needle, and presser foot, I, at the extreme forward end of the table, C, all constructed and arranged as shown and described.

3d, In combination with the shuttle driver, M, at or near the forward end of the table, C, the pinions, d e, and rack, f, substantially as and for the purpose herein set forth.

76,808.—MORTISING MACHINE.—George. B. Phillips (assignor to Alexander G. Hues), Poughkeepsie, N. Y.

I claim the hinged or detachable holder, F, so connected to the standard or frame, B, that it may be removed or turned aside at pleasure, and constructed to receive the shank of the table, or other support adapted to the work, substantially as shown and described.

76,809.—PIN BOOK.—Truman Piper (assignor to Howe Manufacturing Company), Birmingham, Conn.

I claim the herein-described pin book, consisting of the continuous strip of paper, A, having thereon a succession of rows of pins, and folded, and their point ends secured in the manner described, and having combined therewith the inclosing cover, H and I, substantially as herein set forth.

76,810.—SWING SHEEP FEEDER.—Amos Putnam, Vernon, Big Bend Post Office, Wis.

I claim the removable spout, B, hung in open bearings within the opening in the floor, C and provided with flanges on both faces and at both sides, when so arranged that as its lower end is swung to either side, its upper end will cover one part of the opening in the floor, C, whereby hay or other feed is conveyed from said floor, C, into either one of the parallel racks, cribs, or troughs, as set forth.

76,811.—CAR WHEEL.—John Raddin, Lynn, Mass.

I claim, in combination with the felly, c, the tire, d, having a flange, f, projecting over the face of the felly, the felly and tire being bolted together, and having elastic cushions so disposed as to receive the direct lateral strain upon the felly or tire, substantially as described.

Also, combining with the felly and tire, made relatively movable, the elastic cushions, k, placed in recesses in the felly periphery, and bearing, either directly or through the shoes, j, upon the tire, substantially as shown and described.

Also, the elastic cushions or springs, q, placed in the sockets, p, and resting upon seats, s, with means for forcing out the cushion radially, the cushions being surfaced by a cap, o, or bearing directly against the tire, substantially as described.

76,812.—STOVEPIPE ELBOW.—Carl Recht, New York city.

I claim the detached ring, d, in combination with the plain flanges, b c, on the parts, B C, of an elbow, A, substantially as and for the purpose described.

76,813.—PASTRY JIGGER.—Jerome Redding, Charlestown, and John B. Coe, Boston, Mass.

We claim, as a new article of manufacture, a pastry jigger made up of a circumferential marker, b, and a shank, which, while operating as a gage, is notched, so as also to serve as a marker, as described.

76,814.—PROPELLING VEHICLES.—Thomas Rhoads, Fiskilwa, Ill.

I claim, 1st, The arrangement, with relation to the revolving shaft, L, carrying the wheels, A', of the wheels, G H J, pinion, b, and spring, S, as herein described for the purpose specified.

2d, The pawl, h, pivoted to the frame, D, when connected to the lower end of the pivoted lever, e, whereby it is made to engage with the ratchet drum, F, when said lever is drawn back to the extent of its vibration, as herein described for the purpose specified.

3d, The brake lever, d, in combination with the ratchet drum, E, pivoted lever, E, and pawl, h, as herein described for the purpose specified.

4th, The combination and arrangement of the gearing, G H J, pinion, b, spring, S, ratchet drum, E, lever, e, pawl, h, brake, d, all operating as described for the purpose specified.

76,815.—CHURN.—Thomas Rich, Kingston, N. Y.

I claim the twisted blades, C D, when set in reverse direction upon the shaft, B, the outer blades of each series being entire or without perforations, the inner ones being perforated, as shown and described.

76,816.—HORSE-POWER.—M. A. Richardson, Sherman, N. Y.

I claim, 1st, The projecting beam, A, supporting the gearing, D G F H, and stayed by braces, B C, in combination with the removable driving shaft, E, resting in square socket, d, of the spur wheel, and supporting the forked sweep, P, the whole being specially arranged for allowing the displacement of the said driving shaft, as herein set forth.

2d, The cord, g, passing centrally through the top of the driving shaft, and having a swivel, h, beneath, to prevent twisting, when combined with a belt passing around the horse's belly, in the manner and for the purpose specified.

3d, The special construction and arrangement of the apparatus, as a whole, consisting of projecting beam, A, braces, B C, gearing, D G F H, removable shaft, E, forked sweep, P, pulley, J, crank, K, and the spurring cord, g, in the manner and for the purpose specified.

76,817.—CHAMBER VESSEL.—Charles Robinson, Boston, Mass.

I claim the combination of the concave or inclined cover, B, and valve, C with its extension, d, arranged and operating substantially as and for the purpose herein specified.

Also, in combination with the cover, B, the inclined conductor, g, beneath, substantially as and for the purpose herein set forth.

76,818.—HUB FOR WAGON WHEEL.—W. H. Rodeheaver, Miamisburg, Ohio.

I claim the arrangement of the pair of bands, B C, inclosed in a wooden hub, and being provided with flanges, D E, and interlocked lugs, d e, the whole being secured by rivets, in the manner and for the puprose set forth.

76,819.—SHAFT COUPLING.—P. G. Ross, Davenport, Iowa.

I claim the spherical-shaped shell, A, with the head, B, cast therein, substantially in the manner and for the purpose as herein set forth.

76,820.—NUTMEG GRATER.—John G. Roth, New York city.

I claim, as a new article of manufacture, the nutmeg grater constructed as described, and consisting of the plate, A, forming the bottom and ends of the grater, the side guide pieces, C, convex perforated grating surface, B, sliding block, D, removable tube, E, and disk, F, all arranged and operating as and for the purpose set forth.

76,821.—FLEXIBLE BIT FOR BRIDLES.—B. L. Rowley, New Britain, Conn.

I claim the double eye, A, when used in combination with the rings, B, chain, C, and ferrule, D, for the purpose and substantially as herein set forth.

Also, the flexible bit composed of the double eyes, A, rings, B, chain, C, ferrule, D, and rubber casing, E, for the purpose and substantially as herein specified.

76,822.—UPSETTING MACHINE.—J. F. Sargent, Tunbridge, Vt.

I claim, 1st, The disk, b, and links, m, or other equivalent devices, constructed and operated substantially as shown and described, in combination with the levers, D, and arms, I, all as and for the purpose set forth.

2d, The block, B, and base, A, combined and forming a pedestal for supporting the mechanism, substantially as shown and described, in combination with the bed plate, H, and levers, D, and arms, I, all as and for the purposes set forth.

3d, The levers, D, formed with arms, I, in combination with the links, m, disk, b, and crank, h, all constructed, arranged, and operating in the manner substantially as herein shown and described.

76,823.—THREADING TUBE.—David Saunders, Brooklyn, assignor to Joseph Nason & Co., New York city.

I claim the threading tool herein described, constructed and arranged substantially as herein set forth.

76,824.—RESTORING OLD LEATHER.—Bruno Schmidt, Hoboken, N. J.

I claim the within-described process of restoring old leather, by subjecting the same to the various manipulations above set forth.

76,825.—PREPARATION OF MANGANATES AND PERMANGANATES.—Bruno Schmidt, Hoboken, N. J.

I claim, 1st, A compound of manganate of soda and chloride of potassium, prepared substantially as and for the purpose described.

2d, The within-described process of treating the residuum obtained in the manufacture of chlorine, substantially as and for the purpose set forth.

76,826.—TRACE CLIP.—Peter Schoonmaker, New Britain, Conn.

I claim, 1st, Securing the hold-back ring to a pin, c, which is fastened in the trace clip, substantially as herein shown and described.

2d, Providing the trace clip with a flange, a, for the reception of the pin to which the hold-back ring is secured, so that the hold-back ring is fastened to the trace clip, substantially as herein shown and described.

76,827.—PIPE STEM.—T. S. Scranton, New Haven, Conn.

I claim a tobacco pipe stem, divided into parts lengthwise, so that said parts may be separated to expose the interior of the tube, substantially as and for the purpose set forth.

76,828.—GAS HEATER.—Phillip Schreyer, New York city.

I claim, 1st, The burner, D, constructed as described, consisting of the corrugated upper tube, e, fitted upon the perforated smaller tube, d, as herein described for the purpose specified.

2d, Making the frame of a gas stove polygonal, so that a series of such stoves can be set close together to produce one large heating apparatus, as set forth.

3d, A gas stove, consisting of the V-shaped uprights, a a, polygonal rim, b, block, c, pipe, C, and burner, d e, all made and operating substantially as herein shown and described.

76,829.—WRISTBAND FOR SHIRT.—S. H. Scribner, Chicago, Ill.

I claim attaching the wristband or cuff to the shirt sleeve so as to form a reversible cuff, substantially as herein specified and shown.

76,830.—PAPER BOX.—H. D. Scudder, Amsterdam, N. Y.

I claim forming the sides and bottoms of a circular paper box of one and the same piece, in the manner herein specified.

76,831.—LAWN MOWER.—S. W. Sears, New York city.

I claim, in a hand mower, the combination of the roller or driver, C, with the concentric gear, I', supporting the frame, A, the crank shaft, d, the shifting sleeve gear, the shaft, E, and the reciprocating cutter bar, D, constructed, arranged, and operating substantially as and for the purposes herein described.

76,832.—MEDICINE.—S. P. Sedgwick, Wheaton, Ill.

I claim the medicine or specific, composed of the ingredients about in the proportion as set forth, for the purpose specified.

76,833.—CAR COUPLING.—David V. B. Smart, Troy, N. Y.

I claim the staple, C, having its ends passing through the sides of the draw head in combination with the sliding coupling pin, B, and the slotted draw head, all constructed and operating as described, whereby, as the staple is raised, the pin, B, is swung by the knob, E, clear of the draw head through the slot, H, as herein shown and described.

76,834.—PAPER FILE.—E. J. Smith and Benjamin H. Cheever, Washington, D. C.

We claim, 1st, The combination, in a paper file, of an adjustable plate, with a base and fixed vertical plate, substantially as and for the purpose set forth.

2d, The adjustable plate, A, with the projecting arms, D D, in combination with the bottom plate, B, and end plate, C, substantially in the manner and for the purpose herein set forth.

76,835.—COOK FORK.—Hiram Smith, Des Moines, Iowa.

I claim the lever, D, pivoted at a, to the shank, B, of the fork, its outer end provided with the thumb plate, G, and pivoted at b, to the rod, E, whose lower end is attached to the slide, F, between the tines, C, all constructed, arranged, and operating as described, for the purpose specified.

76,836.—LAMP.—J. Homer Smith, Brewster Station, N. Y.

I claim, as an improved article of manufacture, the device for preventing the descent of flame in lamps, consisting of the cylinders, B B, mounted in fixed bearings, in the wick tube, and as long as said tube is wide, when the outer surface of the cylinder is formed with serrated ribs, extending entirely around the cylinder, grooves being formed between the ribs, as described, for the purpose set forth.

76,837.—MANUFACTURE OF ILLUMINATING GAS.—John Somerville, and Robert Elsdon, Maidstone, Great Britain.

We claim the use of chalk, limestone, or foul gas lime, for the purpose of removing carbon from the interior of gas retorts without injuring them, in the manner substantially as herein described, while, by the same operation a useful product, namely, quicklime, is obtained.

76,838.—LUBRICATING OIL.—Gideon O. Spence (assignor to himself, A. R. Williams, and J. S. Lathrop), Titusville, Pa.

I claim, 1st, As a new article of manufacture, a lubricating oil, made from petroleum or coal oil, or their products, as a base, combined with the second and third chemical ingredients herein specified, for the purposes set forth.

2d, As a new article of manufacture, a lubricating oil, made from petroleum or coal oil, or their products, as a base, combined with the five chemical ingredients herein specified, for the purposes set forth.

76,839.—SCHOOL DESK.—Edward I. Stearns, Cambridge, Md.

I claim a school desk, with the lid opening towards the seat and occupant, and supported in position, when open, by the cleats, B, or other suitable device, so that what is the under side of the lid when shut is the upper side, for the books to rest upon, when open, substantially as above described.

76,840.—MACHINE FOR CLEANSING AND RENOVATING FEATHERS.—Harvey B. Steele, West Winsted, Conn.

I claim, 1st, The arrangement of toe chamber, P, surrounding the inner cylinder, and the cover, H, and slide, E, constructed as described, for the purposes set forth.

2d, The arrangement of the fumigating shaft, C, in combination with the entire double cylinders, A and B, so constructed and regulated by stop cocks that the feathers are first disinfected and afterward steam dried, as herein set forth.

76,841.—APPARATUS FOR MANUFACTURING ILLUMINATING GAS.—Levi Stevens, Washington city, D. C.

I claim, 1st, In combination with the mixing chamber, D, the superheater, E, so that the mixed hydro carbon and hydro oxygen vapors may be superheated before being retorted, substantially as and for the purpose described.

2d, In combination with the mixing and superheating chambers, the arrangement of retorts for retorting the vapors, substantially as described.

3d, The mixing chamber or vessel, L, into which the retorted gas is passed, and into which atmospheric air is forced, and therein mixed with the gas, substantially as described.

4th, In combination with the mixing chamber, L, the cooler, M, so that the cooling shall take place after the atmospheric air is introdnced and mixed with the gas, substantially as described.

5th, In combination with the cooler, M, the purifying chamber, N, furnished with chloride of calcium as a purifier, substantially as described.

76,842.—CAR TRUCK.—Ezra Stiles, New York city.

I claim, 1st, The broad wheeels, E E', when arranged in front of the main wheels, B, and having bearings in the bar, D, and springs, I, substantially as and for the purposes herein set forth.

2d, The chain, G, and chord, H, in combination with the broad safety wheels, E E', arranged as and for the purpose herein set forth.

76,843.—CAR BRAKE.—Ezra Stiles, New York city.

I claim the flanged bearing block or brake block, E E', when made to extend beyond the lines of the wheels, both outside and inside, as represented, and when combined with and operated by the cam, H, lever, H', and spring, G, and chain, I, all arranged substantially as and for the purposes herein set forth.

76,844.—RAILROAD CAR WHEEL.—Ezra Stiles, N. Y. city.

I claim the within-described car wheel, formed of a plate of metal of uniform thickness, by bending and swaging the same in dies, as herein set forth, and having a hub attached thereto, substantially as and for the purpose herein set forth.

76,845.—COMBINED STEAM GENERATOR AND AIR HEATER.—O. M. Stillman, Westerly, R. I.

I claim, 1st, An apparatus for generating steam, and mixing and superheating air and steam, consisting of a furnace, C, a primary generator, B, connected with such furnace by suitable injection pipes, H, and discharge nozzles, n n, and one or more secondary generators, E, arranged and operating together substantially as set forth.

2d, Connecting the furnace, C, with the passages, K, leading to the secondary generator, E, by means of the blast nozzle, n, discharging steam from the primary generator, for the purpose of exhausting the contents of the flue, D, for the passage of gases, and thereby relieving the furnace from pressure, as set forth.

3d, Combining the conducting passage or passages, K, leading to the secondary generator, with the furnace, C, by means of suitable connecting pipes, whereby the products of combustion, in the state in which the same are in the passage, K, can be readmitted to the fire chamber, substantially as described.

76,846.—FRUIT JAR.—Draper Stone, Rochester, N. J.

I claim the annular or flat packing ring, H, constructed and applied substantially in the manner shown and described, in combination with the cover of fruit jars, for the purpose specified.

76,847.—ATTACHMENT FOR CULTIVATOR SHOVEL.—D. C. Stover, Dayton, Ohio.

I claim, 1st, The bearing, C, fitted between the shovel, B, and standard, A, in combination with a slip joint fastening, substantially as and for the purposes described.

2d, The staple, a, fastened to the shovel, B, and the hooked bolt fastening, b b', in combination with the rounded bearing portion, C, interposed between the shovel, B, and recessed standard, A, substantially as described.

3d, So attaching the shovel, B, to its standard, A, that the shovel can be adjusted and set at different angles with respect to the line of draft, without changing the axis of movement of said shovel but of its true line, substantially as described.

76,848.—SULKY PLOW.—B. W. Sutherlen, Freesoil, Minn.

I claim, 1st, The combination of the axle, E, standards, B B, and plow, A, working loosely between the standards, so as to admit of a plow of any construction being suspended by the chains, c c', and drawn by the chain, c''', substantially as and for the purpose specified.

2d, The frame, I, in combination with the pulley, G, and lever, L, substantially as and for the purpose described.

3d, The combination of the lever, L, frame, I, pulley, G, chains, c c', and plow, A, substantially as and for the purpose specified.

76,849.—PLATE LIFTER.—S. J. Talbott, Milford, N. H., assignor to himself, James H. Hall, and James H. Gray.

I claim a device for lifting hot dishes, composed of the bars, A A, connected by hinges or joints, a a, with a spring, B, placed between them and each bar having a jaw, C, attached, substantially as shown and described.

76,850.—WASHING MACHINE.—Edward T. Tinch (assignor to himself and George R. Harris), Salem, Ind.

I claim, 1st, The flanged drum, C, provided with latches, b b, and combined with a flexible concave of rolling or rubbing bars, E', and a device for forcibly depressing this concave, substantially as described.

2d, The combination of a lifting cord, d, with a flexible concave, a rotary flanged drum, C, and a device depressing the concave upon the articles being washed, substantially as described.

3d, The construction of the drum, C, with flanges upon its ends, and also with spring latches, b b, for the purposes and in the manner substantially as described.

76,851.—MACHINE FOR RAKING POTATOES.—Daniel J. Tittle (assignor to Abbie M. Tittle), Albany, N. Y.

I claim a root comb or rake, constructed of a number of teeth, A A, of shape shown in fig. 5, arranged in position and secured as described, and operated with a single or crotch beam, B, or its equivalent, and provided with one or more handles, H H, as set forth and described.

76,852.—LAMP FOR VEHICLE.—Chas. F. Waldron, N. Y. city.

I claim, 1st, The annular internal plate, C, formed with the flange, b, in combination with the lower portion or edge of the body, A, substantially as and for the purpose herein set forth.

2d, The annular nut, D, in combination with the base shell, B, and internal plate, C, substantially as and for the purpose specified.

76,853.—APPARATUS FOR BREWING, MALTING, ETC.—Andrew Barclay Walker, Warrington, England.

I claim, 1st, The general construction and arrangement of the apparatus for attemperating air, as described, and illustrated in figs. 1 2 4, and 6, of the accompanying drawings.

2d, The construction and arrangement of the apparatus for preserving yeast or worts in gyle-tuns, as described and illustrated in figs. 2 and 3, of the accompanying drawings.

3d, The means employed for preserving yeast in the troughs or receivers, as described and illustrated in figs. 5 and 6 of the accompanying drawings.

4th, The construction and arrangement of the apparatus for attemperating the atmosphere in malting rooms, gyle-tun rooms, cellars, etc., as described and illustrated in fig. 7.

5th, The construction and arrangement of the apparatus for cooling worts, as described, and illustrated in figs. 10 11 and 12, of the accompanying drawings.

76,854.—KNITTING MACHINE.—Benjamin Ward, Troy, N. Y., assignor to Clark Tompkins.

I claim a claw, comb, or equivalent device, arranged in respect to the needles of a knitting machine, and combined with mechanism for stopping the machine, substantially as described, so that yarn which has fallen or been taken out of the needles will catch on or engage with the claw, comb, or equivalent device, and cause the machine to stop.

Also, in a knitting machine having spring barbed needles, a stripping wheel M, arranged as described, so as to take knots or loose yarn out of the needles, and thereby prevent the injurious retention or accumulation of such knots or yarn in the needles, substantially as herein set forth.

Also, the arrangement in a knitting machine having spring barbed needles of a stripping wheel just forward of the "sinker wheel," or device for feeding yarn into the needles, substantially as herein set forth.

Also, in knitting machines, a series of needles and a stopping mechanism, combined with a comb, or its equivalent, and a stripping wheel, substantially as described, so that yarn taken from the needles by the stripping wheel will engage with the comb or its equivalent, and stop the machine.

Also, in knitting machines, a stripping wheel and a cam, or its equivalent, combined with a circular series of spring barbed needles, substantially as described, so that the cam or its equivalent will press or hold the knit fabric or old loops back on the needles at the place where the stripping wheel is arranged to take waste or loose yarn out of the needles.

Also, in combination with a series of needles in a knitting machine, a stripping wheel, a cam, or its equivalent, for pressing or holding the knit fabric back on the needles at the point where the stripping wheel acts, a comb, or its equivalent, for engaging with yarn taken from the needles by the stripping wheel, and a stopping mechanism, substantially as herein set forth.

76,855.—Window Blind.—Chas. H. Warner, Pittsfield, Mass.

I claim a blind, in which the tenons of the slats, a a, etc., are formed of tubes of metal, b b, etc., inserted into the ends of the slats, substantially as herein shown.

76,856.—Dray.—Edward Warren, and Thomas Brangwin, Ceresco, Mich.

We claim, 1st, The dray shafts, D, provided with a semicircular bowhead, E, in combination with the hinged sections, A and B, of the platform bed of a dray, substantially as and for the purpose specified.

2d, The arrangement and combination of the spring catches F, lock plates, L, cranked tilting cam shaft, T, and spring stop, S, with the aforesaid hinged sections, and pivoted bow headed shafts, substantially in the manner and for the uses set forth.

76,857.—Boom Gear.—Charles R. Webb, Philadelphia, Pa.

I claim the slides, A A', or their equivalents, interposed and properly secured between a vessel's saddle, E, and the forward ends of the jaws, C C', for the purpose of preventing the jaws from chafing the saddle, substantially as herein described and for the purposes set forth.

76,858.—Horse Collar.—Eugene Webber, Portage, Mich.

I claim the metallic boxes, B B, with elongated slots, a a, and shanks, b b, as constructed and arranged for fastening the collar in the manner as described and shown.

76,859.—Chimney Cap.—Henry J. Weed, Cazenovia, N. Y., assignor to himself, E. S. Card, and F. Carpenter.

I claim providing chimney caps or smoke stacks with two or more rows of draft openings, arranged one above the other, the spaces between the openings being struck up to form inclines, b, the part above said openings being struck out, and the part below struck in, whereby said openings are transformed into elliptical holes, a a, as herein shown and described.

76,860.—Cotton or Hay Press.—J. Wentz, Girard, Ala.

I claim, 1st, The movable cotton box, A, with its slot, c, substantially as shown and described, in combination with one or more toggle bars, E, and capstan power, as and for the purpose set forth.

2d, In combination with the movable box, A, having slots, c, and with the toggle bars, E, the followers, E, when provided with projections, d, all constructed, arranged, and operating as and for the purpose set forth.

76,861.—Belt Stud.—David M. Weston, Boston, Mass.

I claim, 1st, Rendering the heads rigid, by swaging or compressing them, substantially as described.

2d, Forming the heads with a rounded or convex surface, e, as herein set forth.

3d, A belt stud, having a soft or yielding bar, b, and rigid heads, c, constructed substantially as shown and described.

76,862.—Clothes Dryer.—Miles B. Wheaton, N. Y. city.

I claim the frame, a b, with the two pairs of legs, c g, one pair provided with knuckles, i, the other resting against the rungs, b, to admit of the parts being folded parallel, as shown.

76,863.—Bolt Trimmer.—Aaron B. White, Mendon, Mich.

I claim the combination of the levers, d d', having stops, J J, thereon, with shear-levers, a a, straps, b b and I f, all constructed, arranged, and operating substantially as described.

76,864.—Street Letter-Box.—Daniel White and George H. White, Chicago, Ill.

We claim, 1st, The street letter-box, A, of the shape as described, with projecting and pointed roof, B, and the sides narrowed toward the bottom, provided with movable bottom forming door, D, the joints between said door and box protected by cornice, G, the whole arranged and operating substantially as herein set forth and specified.

2d, The inside guides or flanges, d d, of the openings, C C, arranged and operating substantially as set forth, and for the purpose specified.

3d, In combination with the above, the ears, H H, loops or staples, I I or K K, and brace, L, substantially as herein shown and described.

4th, The sexagonal or octagonal letter-box, constructed as shown and described, provided with six or eight openings for letters and newspapers, and securely placed on an iron stool, the same being secured to the floor or sidewalk, substantially as set forth.

76,865.—Combined Planter and Manure Distributor.—Benjamin F. Whitner, Madison, Fla.

I claim, 1st, Making one of the flanges, h2, of the cylinder, H, movable, and securing it in place, clamping the jointed recessed ring, I, between it and the stationary flange, h', by means of the nut, J, screwing upon the said cylinder, H, substantially as herein shown and described, and for the purpose set forth.

2d, Adjustably securing the hopper, F, in place within the hopper, E, by means of bolts and set-screws, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of a removable weight, K, with the covering-drag, J, substantially as herein shown and described, and for the purpose set forth.

4th, The discharging hopper, M, constructed in two parts, in substantially the form herein shown and described, and adjustably secured to the under side of the frame, B, as and for the purpose set forth.

5th, The stirrer-shaft or cylinder, N, having radial arms, n1, and side arms, n2, attached to or formed upon it, in combination with the peculiarly-shaped hopper, M, and with the frame, B, substantially as herein shown and described, and for the purpose set forth.

76,866.—Foot-Scraper.—Wm. L. Williams, N. Y. city.

I claim, 1st, The brushes, h, jointed to the swinging arms, f, and acting in the manner and for the purpose specified.

2d, The swinging brushes, h, in combination with the swinging arms, f, scraper, b, and brushes, E, substantially as and for the purposes set forth.

76,867.—Ferry Bridge.—A. C. Willson, Green Point, N. Y.

I claim, for elevating or depressing the bridge at will, the variable float, C, constructed and operating substantially as herein described.

76,868.—Horse Hay Fork.—Franklin M. Willson (assignor to himself and Isaac G. Dundore), Whitney's Point, N. Y.

I claim, 1st, The combination and arrangement of the compound detachable rod, G, with the tines, L L, opening from and closing into the recess, D, so that, when closed, their points will meet near the pointed end of the point, B, and when opened or expanded, will operate as herein described.

2d, Constructing the sheath, A, with the detachable pointed end, B, in combination with the spring, J, tumbler, I, pin or key, F, hole, P, and joint-pin, C, all being constructed substantially as herein described and represented, for the purpose set forth.

76,869.—Mode of Treatment of Foot-Rot and other Diseases in Sheep.—George Wilson, New Lexington, Ohio.

I claim the above-described mode of treating diseased sheep having "foot-rot," "dry decay," "scours," etc., i. e., by extirpating the biflex canal, in the mode and by the process herein described.

76,870.—Clothes-Sprinkler.—William V. Wilson, Philadelphia, Pa.

I claim, 1st, Constructing a clothes-sprinkler with a perforated pipe, E, substantially as and for the purpose specified.

2d, The combination of the pipe, E, and plate, C, when the same are arranged substantially as described.

3d, The combination of the pipe, E, and top plate, F, when the latter is so constructed that only a portion of the same is perforated, substantially as and for the purpose specified.

76,871.—Waistband for Wearing Apparel.—Zadig Wolfsbruck, New York city.

I claim the waistband for drawers, provided with the adjustable fastening device, consisting of the tapes, F F', G G', H H', passing through suitable pockets therein, and fastened thereto by means of hooks, B E', and eyes, a a, as described heretofore.

76,872.—Paper-File.—Edmund W. Woodruff and George C. Green, Washington, D. C.

We claim, 1st, A file, for holding papers or other similar articles, with hinged joints, so that it may be folded together when not in use, substantially as set forth.

2d, A paper file, with the clamping device so arranged that the clamp lever will turn backward or forward, for the purposes specified, without being detached from the file, substantially as shown.

3d, Attaching the file-board to the lever-clamp with a hinge, or its equivalent, substantially as shown.

76,873.—Bolt and Rivet Machine.—George Worstenholm, Newark, N. J.

I claim the feeding-slides, h, and wedge-blocks, g, in combination with screw, l, and pin, k, that presses the rod, I, upwards to hold it while being fed to the machine, substantially as shown.

76,874.—Harness.—Geo. M. Zell, Waynesville, Ohio.

I claim the combination of the holder-plate, E, having the elastic cushion, J, the link, D, strap, F, and notched plate, B, upon the under side of the shaft, A, all constructed and arranged as described for the purpose specified.

REISSUES.

2,916.—Cement for Fixing Door-Knobs.—Patrick Kennedy, New York city. Patented June 11, 1867.

I claim the application of a cement, which is composed of sand and alum, with or without the addition of copperas, for fastening door or furniture-knob tops to their metal or other shanks, as set forth.

2,917.—Railroad Car Heater.—Edward H. Ashcroft, Lynn, Mass. Patented May 15, 1866.

I claim a safety car, constructed with a water-space, with one or more showering pipes, and a fusible plug apparatus, arranged substantially in the manner, and so as to operate with respect to the car chamber, as specified.

Also, in combination with a water-space, substantially as herein set forth, a heating apparatus and circulating pipes, whereby the water shall be caused to circulate, substantially as herein set forth.

2,918.—Fluid Meter.—Napoleon Aubin, Montreal, Canada. Patented August 19, 1862.

I claim the combination of a diaphragm with a reversing apparatus and a slide valve, connected each with the other, without the use of stuffing-boxes, and the whole enclosed within a proper receptacle containing a valve seat, and constituting a fluid meter, constructed and operating substantially as above described.

Also, constructing fluid meters with a single slide valve of such length that it will not cover both of the outside ports in the valve seat at the same time, in combination with a reversing apparatus arranged to throw said valve, while acting upon it, rapidly across the said ports, substantially as and for the purpose above described.

Also, the use, in fluid meter, of a diaphragm, when combined with a short slide valve of the above description, substantially as and for the purpose above described.

Also, the use, in fluid meters, of compression springs, when combined with a short slide valve of the above description, substantially as and for the purpose above described.

Also, constructing the receptacle of fluid meters in two pieces, one-half of which contains part of the side pipe, and the other half the other part thereof, when the joint between the two is made by a diaphragm, and the latter acts upon a reversing apparatus contained in one-half of the said receptacle, substantially as above described.

2,919.—Manufacture of Sugar Molds and other Articles.—Theodore A. Havemeyer, I. Laurence Elder, and Chas. F. Loosey, New York city, assignees of Carl Kronig. Patented June 28, 1864.

I claim the process, substantially as herein described, for making vessels and other articles, which process consists in saturating, with linseed or equivalent oil, vessels or articles made of paper, or equivalent substance, in manner substantially as described.

Also, coating articles, which have been made as herein described, and which have been saturated with oil, with a paste of red lead and oil, and then varnishing the same, substantially as described.

EXTENSIONS.

Corn Sheller.—Thomas D. Burrall, Geneva, N. Y. Letters Patent No. 4,300, dated Dec. 6, 1845; extended seven years from Dec. 6, 1859; reissue 2,083, dated Oct. 10, 1865; again extended by act of Congress (private, No. 102), dated March 2, 1867.

I claim, 1st, The opening, d, in combination with plate or disk, c, and the sheller, substantially as and for the purpose described.

2d, The open space between the lower edge of the sheller and the plate or disk, c, in combination with said plate or disk and the sheller, substantially as and for the purpose described.

Iron Car Brake.—Stephen Morse, Springfield, Mass. Letters Patent No. 10,004, dated Sept. 6, 1853.

I claim the spine, B, having the point of suspension, C, and socket, D, with the open spaces, c c, and brace plates, b b, in combination with the rubber or friction surface plate, A, substantially in the manner and for the purpose as is herein set forth.

Apparatus for Combining Hydrocarbon Vapor with Air.—Oliver P. Drake, Boston, Mass. Letters Patent No. 9,967, dated Aug. 30, 1853; reissue No. 1,819, dated Nov. 15, 1864.

I claim the vaporizing chamber and rotary blowing apparatus, combined in the manner and for the purpose substantially as set forth.

I also claim the combination of the vaporizing chamber and rotary blowing apparatus, under the general arrangement described, with a weight, or its equivalent, acting with a uniform force, so that the pressure at the burner is uniform, whether a greater or less quantity of the mixed air and vapor is burnt.

I also claim the combination of the vaporizing chamber with the mechanical agitator, for the purpose of agitating the liquid during the mixture of the vapor with air, substantially as set forth.

I also claim the combination of the heater and gas burner with the water vessel and vaporizing chamber, substantially as specified, so that by means of the said heater and gas burner and the pipes connecting them with the water vessel and the chamber, the whole or a part of the mixture of air and benzole vapor produced by the apparatus may not only be used in any convenient place for the purpose of illumination, but also for heating the water of the vessel, substantially as set forth.

I also claim the combination of the closed vaporizing chamber, the rotary vaporizer or disseminator (placed therein), and the rotary meter wheel and its closed case, or air forcing apparatus, so made as to force a stream of air into the hollow shaft of the vaporizer and through or against saturated portions of the disseminator and into the vaporizing chamber or regenerator, so as to vaporize the benzole or hydrocarbon and mix it with air, substantially as above specified.

And in combination with the rotating meter wheel and its case, and the hot water vessel, I claim the coiled induction air pipe, as made to pass through the water in the vessel, and thereby receive heat therefrom, so as to warm the air as it passes through the pipe, and to supply oxygen to the volatilized vapors, and for the purpose of facilitating the evaporation of the same.

And in combination with the induction air pipe, I claim the chamber and its regulator slide and orifice, applied for the purpose of supplying cold air to the warmed air, or to the meter vessel, in order to diminish or regulate the temperature of the air passage into the said wheel and forced into the vaporizing chamber.

I also claim the peculiar mode of making the rotary disseminator or vaporizer, viz., of two perforated heads or disks, a hollow perforated shaft and strands of lamp wicking or other absorbent material, stretched from one head to the other, as specified.

Spring Padlock.—Henry Ritchie (assignor to himself, Samuel C. Thompson, and Geo. W. Westerfield), Newark, N. Y. Letters Patent No. 9,963, dated Aug. 23, 1853.

I claim the combination of the bolt, C, guard, E, and the double toothed tumbler, D, one tooth, n, of said tumbler fitting in the shackle, d, and the other tooth, j, fitting in the notch at the back of the bolt, the bolt, guard, and tumbler operating as set forth in the body of the specification.

Grain and Grass Harvesters.—Philo Sylla, Elgin, and Augustus Adams, Sandwich, Ill. Letters Patent No. 10,038, dated Sept. 20, 1853; reissued to C. Aultman & Co., Canton, Ohio, in six divisions, A, B, C, D, E, and F, Nos. 721, 722, 723, 724, 725, and 726, dated May 17, 1859.

Division A, No. 721.

I claim, 1st, An elevated binding table in combination with the platform for receiving the grain as it is cut, substantially as set forth.

2d, The combination with the binding table of one or more binders' stands, on a lower level than that of the table, substantially as set forth.

3d, The combination of a binding table with a binders' stand, having an elevated slide for the binder to rest his legs against, and thereby steady himself without the aid of his arms, both of which are thus left at liberty to do the binding, substantially as set forth.

4th, The arrangement of the rakes and binders' stands, substantially as herein set forth, so that the grain may be raked from the platform and delivered upon the binders' table before the several binders' stands in the manner substantially as set forth.

5th, The arrangement of the dumping tray with the rakes and binders' stands, substantially as set forth.

Division B, No. 722, again reissued May 14, 1867, No. 2,608.

Claim, 1st, The combination of a finger beam with slotted guard fingers, a reciprocating scalloped cutter, a double hinge connection between the finger beam and the main frame, and a driving shaft for the cutting apparatus, parallel, or nearly so, to the ground.

2d, The combination of a double hinge floating finger beam with slotted guard fingers, a reciprocating scalloped cutter, and a removable platform for converting the machine from a mower to a reaper.

3d, The combination of a finger beam with slotted fingers, a reciprocating scalloped cutter, a hinged connection to the main frame, a removable platform, and a reel.

4th, The combination of a finger beam with slotted fingers, a reciprocating scalloped cutter, a hinged connection to the main frame, and arms or levers, or their equivalents, for adjusting the hight of the cutting apparatus.

Division C, No. 723.

Claim. The short finger beam, in combination with the yielding connection with the main frame, or its equivalent, substantially as herein set forth.

Division D, No. 724.

Claim. The combination of the finger beam with the hinges by which it is drawn, arranged above the plane of the cutter, substantially as herein set forth.

Division E, No. 725.

Claim. The combination of a counterpoise weight, or the equivalent thereof, with that end of the finger beam next the main frame, to equalize its pressure upon the ground, substantially as set forth.

Also the combination of a counterpoise weight, or the equivalent thereof, with each or either end of the finger beam, to diminish its pressure upon the ground, substantially as set forth.

Division F, No. 726.

Claim. The combination of a stop with the mechadism for connecting the finger beam with the main frame, and allowing it to rise and fall, substantially as herein set forth.

Machine for Paring Apples.—Ephraim L. Pratt, Boston, assignor to James Sargeant and Daniel P. Foster, Shelburne, Mass. Letters Patent No. 10,078, dated Oct. 4, 1853.

I claim hanging or connecting the block, S, which carries the knife to the rod which carries said block, so that the block and knife can vibrate in one or either direction, by means substantially as herein described or their equivalents, so as to allow the knife to vibrate and accommodate itself to any irregularity in the surface of the apple or vegetable pared, substantially as described.

Machine for Grinding Plow Castings.—Joshua Gibbs, Canton, Ohio. Letters Patent No., 10,068, dated Oct. 4, 1853.

I claim the carriage upon which the carriage is fastened, with the weight and grooved stand upon which the carriage is moved, arranged and operated as described.

Machine for Turning or Cutting Irregular Forms.—Nathaniel Gear, Marietta, Ohio. Letters Patent No. 10,204, dated Nov. 8, 1853.

I claim the combination of knives in the manner described, with a rotary cutter head, so that said head shall serve as a guide or directrix to the form or pattern carrying the material to be dressed.

Machine for Figuring Carpenters' Squares.—Norman Millington and S. M. George, Shaftsburg, and Abraham B. Granger, Bennington, Vt., and Leland J. Mattison, Cleveland, Ohio, executors of Dennis J. George, deceased. Letters Patent No. 10,136, dated Oct. 18, 1853.

We claim the combination of the revolving chase wheel, W, with the lateral moving anvil, A, by which the relative position of the square to be stamped and the required chase is so regulated that the line of the square to receive the impression is brought under the chase containing the desired figures, substantially as herein set forth.

Application of High Pressure Engines to Screw Propellers.—Harry Whittaker, Buffalo, N. Y. Letters Patent No. 10,145, dated Oct. 18, 1853.

I claim the direct application of the crank outside of the hull to side-screw propellers, where such application is combined with or effected by a high pressure engine, arranged also outside of the hull, substantially as herein above set forth.

Spring Clamp for Clothes Lines.—David M. Smith, Springfield, Vt. Letters Patent No. 10,163, dated Oct. 25, 1853.

I claim the above described improved clothes pin, that is to say, I claim the arrangement of the line opening, D, and the spring, C, on opposite sides of the hinge, a, of the two levers, A B, all substantially as hereinbefore specified, whereby by pressure of the longer legs of the levers between the thumb and fingers of the hand of a person the instrument is rendered very convenient of application, without danger during the same of tearing the clothes secured by it on a line.

Trip Hammer.—Bernard Hughes, Rochester, N. Y. Letters Patent No. 10,923; dated May 16, 1854.

I claim adding to the stem or rod of the trip hammer, a piston working in a cylinder, open on the upper end and closed at the bottom, and provided with regulating cock and valve, substantially as described, by which means I am enabled to add the whole or such part of the pressure of the atmosphere as may be desirable to the weight of the hammer in giving the blow.

Screw Nail.—Samuel Pratt, Hammonton, N. J.—Letters Patent No. 10,171, dated Oct. 25, 1853.

I claim a screw nail constructed with a thread, shaped substantially as herein described.

I also claim shaping the head, substantially as herein set forth, so that the battering caused by the driving will not obstruct the application of the turn screw.

Machine Hammer.—Daniel Noyes, Abington, Mass.—Letters Patent No. 10,170, dated Oct. 25, 1853.

I claim, 1st, A machine for hammering iron, etc., having the distinguishing feature hereinabove enumerated, viz: a hammer for giving the blow upon the upper surface of the iron acting in conjunction with two hammers which simultaneoously strike the sides of the iron, substantially as above set forth, and I further claim, in a machine for hammering iron, the use of these two side hammers, operating as specified, whether used in connection with the upper hammer or without it.

3d, I claim so arranging the relative position of the fulcra of the hammer beams, and the ends of the connecting rods attached to said beams and to the crank shaft and gears from which they derive their motion as to bring the said fulcra and connecting rods in nearly a straight line at the time of giving the blow, for the purpose above specified, the opposite ends of the connecting rods just before giving the blow moving in opposite directions, so as to give a rapid and powerful blow.

3d, I claim causing the anvil to descend from the iron just before the blow of the side hammers, and to ascend just before the blow of the upper hammer, by means of a rod attached at one end to the under side of the upper hammer beam, and at the other end to a tilting arm which embraces the anvil, substantially as above described.

Feed Rollers of Straw Cutters.—Robert Sinclair, Jr., and Richard F. Maynard, Baltimore, Md.—Letters Patent No. 10,238, dated Nov. 15, 1853.

We claim the employment thereon of alternate right and left pins, so arranged as to form a double spiral or screw, said pins being formed substantially as set forth, and operating together so as to prevent the straw from crowding to the right or left, and to compress the straw laterally as it is passed to the knives, and constituting altogether what we denote the double-screw propeller for straw cutters.

Machine for Trimming the Soles of Boots and Shoes.—Charlotte B. Thompson, administratrix of John H. Thompson, deceased, James M. Thompson, and Hosea Q. Thompson, of Holderness, N. H.—Letters Patent No. 10,239, dated Nov. 15, 1853.

We claim a machine in which the sole is trimmed by revolving knives and guided, as fed along by the operator, by an adjustable gage bar, against which the edge of the pattern plate abuts, substantially as hereinabove described.

Uniting Shovel Blades to Handle Straps.—L. S. White, administratrix of Jonathan White, Antrim, N. H.—Letters Patent No. 10,244, dated Nov. 15, 1853.

I claim the uniting, by welding, of the iron handle straps to the sheet cast steel blade, in the manner substantially as herein set forth.

Combined India-Rubber and Steel Springs.—E. T. Bussell, Indianapolis, Ind.—Letters Patent No. 10,280, dated November 29, 1853.

I claim the fluting a column of vulcanized India-rubber longitudinally, and then so surrounding it with the helical spring, mine being an improvement upon Ray's spring.

Sewing Machine.—William Butterfield, Boston, Mass.—Letters Patent No. 11,240, dated July 4, 1854; Reissued to E. Townsend No. 1,600, dated Jan 5, 1864.

I claim separating into two instruments, a presser-foot and a rest cast-off, both operating on the surface of the material to be sewed, the tube or holder hereinbefore referred to, so that the rest cast-off can act independently of the presser foot, as respects its times and extent of motion, substantially in the manner specified.

Also constructing the rest cast off of such a form that it operates and is located in front of the barb of the needle, instead of surrounding it, by which construction it operates in an improved manner, especially when sewing in narrow channels.

Also, making the rest cast off adjustable with reference to the needle, substantially as described.

Also, the combination of a supporting surface crochet needle and presser foot with a rest cast-off, operating substantially as described.

Also, the improvement by which the rest cast-off is rendered capable of adapting itself to any ordinary thickness or variation of the thickness of the fabric or article to be sewed, such improvement consisting in the above described mode of operating it by the spring, F, applied to the carrier lever, E, and made to operate on the lower end of the recess, C, as stated.

Also, the combination of the bobbin holder, U, with the spring, V, the friction disk, R, and the axle on which the holder turns, the same enabling an empty bobbin to be removed from the holder and a full one put in its place without disturbing the connection of the spring with the bobbin and friction plate or disk.

Stripping Top Flats in Carding Machines.—Wm. B. Bates, of Mansfield, Mass., administrator of George Wellman, deceased. Letters Patent No. 14,481, dated March 18, 1856, antedated Nov. 25, 1853; reissue No. 2,705, dated July 30, 1867.

I claim, 1st, The combination of the segmental gear and its set rim or locking plate with a pinion and its locking plate or recess, as a device for imparting an intermittent rotation to mechanism from a continuous one, for the purpose of operating the stripping mechanism, or that which moves the cleansing frame from one top card to another, substantially as described.

2d, The combination of said device for producing intermittent rotation with the mechanism that lifts the strips and lowers the top card, substantially as described.

3d, The combination of the said device for producing intermittent rotation with the mechanism that moves the cleansing frame from one top card to another, substantially as described.

4th, Combining and arranging the segmental gear and its set rim or locking plate with the two pinions, each with its locking plate or recess placed on opposite sides of said segmental gear, so as to operate the stripping apparatus and move the cleansing frame, alternately, substantially as described.

5th, The combination and arrangement of the mangle pins or teeth in the arc of a circle directly attached to the cleansing frame, and concentric with its movement, for the purpose of avoiding intermediate gearing, substantially as described.

6th, Mounting the stripper card upon radial arms that have their centers or axes below the stripper card and near the axes of the cleansing frame, substantially as described.

7th, The combination of the cams, X X, with the levers, Y Y, carrying and operating the stripper card, substantially as described.

8th, The combination of the cams, X X, with the lifting rods, Z Z, and the levers, Y Y, arranged to operate in connection, substantially as described.

9th, The combination of the cams, X X, with the chain belts, Q', the chain pulleys, R', and shaft, M, arranged and operating substantially as described.

10th, The combination of the guide, E', on the cleansing frame, with the stationary guide, D', on the frame of the machine, cooperating substantially as described.

11th, The combination of the springs, F', and the pins, E', and lifting rods, Z, and their application to the frame, S, substantially as described.

12th, The mechanism for cleansing the stripper card, arranged and applied substantially as described.

Stripping Top Flats for Carding Machines.—Wm. B. Bates, Mansfield, Mass., administrator of Geo. Wellman, deceased. Letters Patent No. 10,298, dated Dec. 6, 1853; reissue No. 2,706, dated July 30, 1867.

I claim, 1st, The combination and arrangement of a continuously revolving radial arm and pin, or crank pin, and a circular locking plate connected therewith, with a series of intermittently revolving radial working grooves to receive said pin, connected with a locking plate provided with segmental recesses corresponding to said grooves and to the other locking plate, substantially as described.

2d, Combining with the cleansing frame a mangle gear and the mechanism herein described for imparting an intermittent motion to the same, suitably arranged, by which the cleansing frame is moved from one top card to another in any order desired in both directions, and held at rest while the cleansing operation is performed, substantially as described.

3d, So combining and arranging the cleansing frame, the mangle gear, and pinion, and mechanism for giving it intermittent motion, when the motion of the cleansing frame is from one top card to the next but one, that when the pinion passes around the extremity of the series of pins or teeth of the mangle gear to the opposite side of the same, the distance of the point from where the pinion starts to where it stops on the mangle gear will correspond to the movement of the cleansing frame from one top card to the next to it, and thus shift the order of cleansing the top cards when the frame is moving in opposite directions, substantially as described.

4th, Attaching the stripping card to radial arms, so arranged that by the oscillation of said arms the stripping card will be carried beneath the raised top card to cleanse the same, substantially as described.

5th, Forming the working faces of the cams that raise the top cards in separate and detached segments, placed so as to act in succession in combination with a series of projections or working surfaces on the device that raises the top cards, substantially as described.

6th, The combination and arrangement of the several correspondent parts of mechanism, both new and old, so as to form a complete apparatus by which the top cards of a carding machine may be automatically stripped or cleansed, substantially as described.

Machinery for Making Barrels.—Geo. W. Livermore, Cambridgeport, Mass. Letters Patent No. 10,689, dated March 21, 1854.

I claim, 1st, Forming or shaping the staves previous to jointing them, by passing them through a series of pairs of curved rollers, in the manner set forth and for the purpose described.

2d, The peculiar construction of the carriage of the jointing machine, represented in fig. 5, the bar, g, being made adjustable within the long slots or mortises, in the manner set forth and for the purpose described.

3d, I claim the combination of the cone Q1, with the spring devices, g", operating as described, for the purpose of guiding the hoop to the barrel and driving it into place, in the manner set forth.

Valve Arrangement for Steam Hammers.—James Watt, Charlestown, Mass. Letters Patent No. 10,297, dated December 6, 1853.

I claim, 1st, The revolving valve rod, the barrel, g, and the adjustable screw stop, l, constructed arranged, and operating in the manner substantially as described, by which I am enabled at any instant to admit the steam beneath the piston, during any portion of the fall of the hammer, without altering the effective force and length of the stroke.

2d, I claim, in connection with the above, the arrangement for throttling the steam on its way from beneath the piston, by which means I am enabled to regulate the intensity of the blow of the hammer to any degree of nicety or to hold the same suspended above the anvil, in the manner and for the purpose substantially as set forth.

Process for Purifying Fatty Bodies—Richard A. Tilghman, Philadelphia, Pa. Letters Patent No. 11,766, dated October 3, 1854; antedated January 9, 1854.

I claim the manufacturing of fat acids and glycerin from fatty bodies by the action of water at a high temperature and pressure.

Replacing Cars upon Railroad Tracks.—Lucian B. Flanders, Philadelphia, Pa. Letters Patent No. 10,301, dated December 6, 1853.

I claim replacing railroad cars and locomotives upon the track, or replacing the car wheels upon the rails, in the manner substantially as herein described, viz., by means of flanges, C C', having inclined bottoms, and secured or attached to the rails, when designed to be used, by the lips or projections, b, on the sides, a, of the flanges, said lips or projections clasping or fitting over the rails, the flange, C', being provided with a movable guide, E, which directs or guides the wheels upon the rails, and which guide, by being movable, will act upon the wheels, the flange, C', being adjusted to either side of the rails.

Design for Stove Plate.—Charles J. Wilson, Cleveland, Ohio. Letters Patent No. 1,349, dated December 4, 1860.

I claim the configuration and arrangement of said ornaments, as herein designated and represented.

Advertisements.

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*

Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

Abridgments

OF SPECIFICATIONS OF BRITISH

PAT'D INVENTIONS,

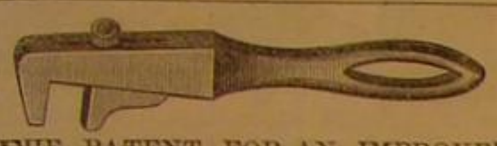
From the Earliest enrolled to the Present Time. In 17mo volumes, and each limited to the inventions of one class only
Sold separately.

D. VAN NOSTRAND,
192 Broadway, New York.

☞ New Catalogue of Scientific Books, brought up to April 1, now ready.

FOR SALE—
Wholesale Manufacturing business, with ten thousand dollars' worth of Improved Machinery, all now in full operation, Real Estate, Buildings, and Material. Large Trade, paying 20 per cent. No better location. $20,000 to $30,000 required. For full information address,
T. E. POWELL, Delaware, Ohio.

FABRICATION OF VINEGAR.—Prof. H. DUSSAUCE, Chemist, is ready to furnish the most recent processes to manufacture vinegar by the slow and quick methods, with and without alcohol, directly from corn or other grains. Address New Lebanon, N. Y.
18 2*



THE PATENT FOR AN IMPROVED WRENCH FOR SALE.—It will be seen that this Wrench is of a very simple construction, and has the advantage of great simplicity and strength over all other Wrenches now made. Address the Inventor,
B. S. LAWSON,
1* 21 Dunham Place, Brooklyn, E. D., N. Y.

THE EXCELSIOR DISH WASHER.—Patented July, 1867, for seventeen years. The proprietor is now prepared to sell Rights to manufacture the the above machine for States, Territories, Counties, Cities, and Towns. 500 000 are required immediately to introduce them, and the demand will be constantly increasing. Manufacturers or Capitalists disposed to take hold of it extensively will be called on, if so requested, and a sample machine furnished. For further particulars or circulars address J. LOMAS, Fishkill Landing, N. Y. 1*

WISELLS' SPOKE LATHE.—Turns two and three at a time, of Ax, Pick, Hammer, Plow, and Sledge Handles, and, also, of all kinds of irregular work in wood. Sold in Pennsylvania only by
17 2* BECKWITH, SELLERS & CO., Franklin, Pa.

CANVASSERS wanted for the combined stamp attacher, letter sealer, inkstand, pen rack and wiper, calendar check and envelope case. Expressed, prepaid, for $5. Circulars free. Address
17 4* J. H. MARTIN, Hartford, N. Y.

DIRECT-ACTING STEAM PUMPS,—and Boiler Feeders, in lieu of Injectors. Address, for circulars, the Sole Manufacturers,
COPE & CO.,
17 6 No. 118 East 2d st., Cincinnati, Ohio.

LABORATORY OF INDUSTRIAL CHEMISTRY.—Advices on chemistry applied to arts and manufacturers, metallurgy, agriculture, etc. Informations on chemical fabrications, with plans of factories and apparatus. Analyses of every kind. Address Prof. H. DUSSAUCE, chemist, New Lebanon, N. Y.
17 2*

ASHCROFT'S LOW WATER DETECTOR will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York. 12 12*

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21*

MODELS, PATTERNS, EXPERIMENTAL, and other Machinery. Models for the Patent Office, built to order by HOLSKE MACHINE CO., Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN office. 14 tf

---

EMPLOYMENT.—$15 to $30 a day guaranteed. Male or Female Agents wanted in every town—descriptive circulars free. Address
15 13—N.] JAMES C. RAND & CO., Biddeford, Me.

FOR STEAM ENGINES, BOILERS, SAW Mills, Cotton Gins, address the ALBERTSON AND DOUGLASS MACHINE CO., New London, Conn. 15 tf

---

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.
16 4

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes.
12 tf] M. & T. SAULT COMPANY. New Haven, Conn.

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail.
BENEDICT BROS., Jewelers, 171 Broadway.
BENEDICT BROS., up town, 691 Broadway.
BENEDICT BROS., Brooklyn, 234 Fulton st. 1 tf

A WATCH FOR $1. THE MAGNETIC Time Indicator and Compass, in a neat case, with glass shade, steel and German Silver works, white enamelled dial, ordinary watch size, sound and serviceable. Warranted to denote correct time, and keep in order for two years. Where satisfaction is not given, the money will be returned. Sent, postpaid; for $1; three for $2; or by express, C.O.D., on receipt of $1 as a guarantee. Address HUNTER & CO., Hinsdale, N. H. 16 3

BOILER FELTING SAVES TWENTY-five per cent of Fuel. JOHN ASHCROFT,
12 12*] 50 John st., New York.

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's supplies, of all kinds, at
1 24* M. T. DAVIDSON & CO.'S, 84 John st., N. Y

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 12 12*

POWER PUNCHES AND SHEARS, Straightening Machines, Vertical Drills, etc. Address GREENLEAF & CO. Indianapolis Ind. 7 13* tf

---

PHOENIX IRON WORKS—
Established 1834.
GEO. S. LINCOLN & CO.,
Iron Founders and Manufacturers of Machinists and Gun Tools, 54 to 66 Arch street, Hartford, Conn.
Samples may be seen in our Wareroom. 14 tf

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line. Improved Lathes for making large valves etc. Address Exeter Machine Works, Exeter, N. H. 13 tf

---

WATER WHEELS.—Valentine's Patent Turbine is economical and durable. Built by VALENTINE & CO., Ft. Edward, N. Y. 17 2*

A PORTABLE ENGINE AND BOILER for sale Cheap, of best Material and Workmanship. Has been in use but three months. Will be sold very low. Call on or address JNO. ASHCROFT,
17 2 50 and 52 John st., New York.

GREAT ECONOMY IN

WATER POWER.

LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet for 1868 sent free on application. 12 40s* 16 41s*

Cheap, Useful, AND *Elegant.*

IMPROVED BRONZE ALUMINUM HUNTING CASED WATCHES,
(the qualities and resemblance of this new metal are such, compared to Gold, that even judges are deceived), and ROSKOPF'S PATENTED PEOPLE'S WATCH.

The Improved Bronze Aluminum of which my watches are made, is a metal differing entirely from any ever offered to the public. It has seriously occupied the attention of scientific men, and has not only called forth the eulogium of the press, in consequence of its peculiar properties, but has also obtained a Gold Medal at the Paris Exposition and even been favorably noticed by rescript of his holiness, Pius IX., authorizing its use in the manufacturing of church goods.

The qualities of this metal are such that it is surpassed by none, if we except gold itself, and that only on account of the intrinsic value of the latter. Further details will be found in my circular, which will be sent, postpaid, on demand.

My Watches are of three sizes, all hunting cases, one small for Ladies or Lads, and two for Gents. The movements are well finished, and perfectly regulated. I can, therefore, warrant them excellent time-keepers. These goods being manufactured in my own factory, I am enabled to sell any of the above sizes at the extremely low price of $16.

A full assortment of all kinds of Coains always on hand. Goods sent by Express, C. O. D., with charges. Not responsible for money sent inclosed in letters. Address JULES D. HUGUENIN VUILLEMIN,
tf] No. 44 Nassau Street, New York.

SPICE CAN AND BLACKING BOX Riveting Machines (Improved), Foot or Power. Send for circulars and sample.
W. PAINTER & CO., Patentees,
15 13 45 Holliday, st, Baltimore.

ANDERSON'S PATENT MULEY SAW Hangings. The oscillating lower Muley and self-adjusting rake upper Muley performs ¼ more work with ¼ less power than any other. COE & WILKES, Painesville, Ohio, sole manufacturers, except for the States of Maine and Pennsylvania. Send for circulars. 15 8

A GOOD THING.—HOW TO GET IT. Would you know what you can do best? What calling or pursuit to follow in life? And how to make the most of yourself? Read the PHRENOLOGICAL JOURNAL. It has a very large circulation, is now in its 47th Vol., and only $3 a year. Or the JOURNAL and SCIENTIFIC AMERICAN for $3. Address S. R. WELLS, or MUNN & CO., New York. 15 4

A PRACTICAL WORKSHOP COMPANION for Tin, Sheet Iron, Copper, and Boiler Plate Workers, Plumbers, etc. Send for a circular.
LEROY J. BLINN,
15 4 44 Woodward Ave., Detroit, Mich.

Springfield Brass Foundery, E Stebbins' Manufact'ng Co., Spring'd, Mass., furnish to order every variety of brass and composition castings, car boxes, letters, Babbitt metal, etc., of superior quality. Sample castings can be seen and orders left at Hayden, Gere & Co.'s, 84 Beekman st., N.Y., and Dalton & Ingersoll's, 17 & 19 Union st., Boston. 8 13*

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies.
12 12*] JOHN ASHCROFT, 50 John st., New York.

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip Saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse, 107 Liberty st., New York. 15 8*

FOREMAN AND MOLDER WANTED. Address STEARNS, CLARK & CO., Erie, Pa. 16 3

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents.
12 tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

WROUGHT-Iron Pipe for Steam, Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y. 12 12*

J. R. ROBINSON, Consulting and Superintending STEAM ENGINEER,
28 State st., Boston, Mass.
☞ Particular attennon given to Inspecting and Testing Steam Machinery, as to safety of Boilers, power of Engines, and as to the useful effect of fuel consumed.
14 5*

For Sale Below Cost.

FIFTEEN PORTABLE STEAM ENGINES, Different Sizes; 8 Portable Flour Mills; 6 Lane's Patent Circular Saw Mills; 1 Muley Saw Mill, Anderson's Patent, and other Machinery. Send for printed description to Washington Iron Works, Newburgh, N. Y., or to WARD & STANTON,
57 Liberty st., New York.
Orders for Steam Engines, Boilers, and general machinery solicited. 16 4*

SCREW-BOLT CUTTERS.—Schwirtzer's Patent Bolt Cutters, with an equal amount of power and labor, will cut twice as many bolts as any other machine in use. For sale by the SCHWEITZER PATENT BOLT CO.,
16 4* Green Point, Brooklyn, E. D., N. Y.

Agents Wanted.

FOR THE LIFE OF GEN. U. S. GRANT, By Hon. Henry C. Deming. The only work of the kind issued under the sanction and by the authority of Grant himself. The author is well known as one of the most brilliant writers and eloquent orators in the country. Agents will find this one of the most intensely interesting Biographies ever published in America, and will meet with a ready sale. For particulars, address
S. S. SCRANTON & CO., 126 Asylum st., Hartford, Ct.
16 4

PLATINUM. H. M. Raynor, 748 Broadway, N. Y.

HYDRAULIC PRESSES, STATIONary and Portable for Pressing Powder, Fish, Oil Books, Tallow, Linseed, etc. Send for a circular to
2 eow13*] E. LYON, 470 Grand street, New York.

MOLDING CUTTERS Made to Order.—Send for circular to WM. H. BROWN, 44 Exchange st., Worcester, Mass. 1 eow10*

MACHINISTS send for Price List of Tools. GOODNOW & WIGHTMAN, 23 Cornhill, Boston.
18 eow

SOLID EMERY WHEELS, all Sizes. GOODNOW & WIGHTMAN, 23 Cornhill, Boston.
12 tf eow

IMPORTANT.—MOST VALUABLE Machine for planing, irregular and straight work, in wood, is the Variety Molding and Planing Machine, for all branches of wood working. Our improved guards make it safe to operate. Combination collars for cutters save one hundred per cent. For planing, molding, and cutting irregular forms, the machine is unsurpassed.

We hear there are manufacturers infringing on our eight patents on this machine. We caution the public against purchasing such.

All communications must be addressed to COMBINATION MOLDING AND PLANING MACHINE CO., P. O. Box 3,220, New York city.

Our machines we warrant. Send for descriptive pamphlet. Agents solicited. 6 7eow*

VERY IMPORTANT.

THE WHOLE FOUNDATION OF THE OLD VARIETY MOLDING MACHINE, built at New York, is the GEAR PATENT, extended Sept. 20, 1867. The C. M. and P. Machine Company OWN ONLY A VERY LITTLE OF THE PATENT, outside of the State of New York. The owners, and Attorneys for owners, of the GEAR PATENT, and *sole* manufacturers of the best improved machines made for planing and molding straight and irregular forms in wood, perfectly safe to operate, with improved Feed Table, and improved adjustable collars for combination cutters, saveing 100 per cent (for all the rest of the United States) are

A. S. GEAR, JOHN GEAR & CO.,
New Haven, Conn., and Concord, N. H.
☞ *We Warrant our Machines, and Caution the Public to Buy Machines of Lawful Owners* ONLY.
☞ Send for a Descriptive Pamphlet. 16 eow tf

TREMPER'S PATENT COMBINED GOVERNOR AND CUT-OFF for Stationary Steam Engines.—The undersigned would respectfully call the attention of Steam Engine Builders, and those using steam engines, to the superiority of the above Governor and Cut-off, both as a perfect regulator of speed under all circumstances, and at the same time a great economizer of fuel, its operation being to use the steam required to perform the work in the most effective manner, permitting it to follow the piston at each half-stroke, only so far as may be required by the load at the time on the engine. They can be readily applied to any engine, and in view of what they do accomplish, our experience, together with that of others now using them, warrants us in the assertion that they are much the most economical cut-off now in use. Apply to

PUSEY JONES & CO.,
14 1st e mo] Steam Engine Builders, Wilmington, Delaware.

WOODWORTH PLANERS—IRON Frames 18 to 24 inches wide. $125 to $150.
2 tf b S. C. HILLS, 12 Platt st., New York.

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

IMPORTANT to ENGINEERS. Improved Indicator of low and high water, and high steam in boilers. Patented 1868. SPRINGER, HESS & CO.,
18 6eow No. 150 North 4th st., Philadelphia, Pa.

ESSAYS for Young Men on the Errors and Abuses incident to Youth and Early Manhood, with the humane view of treatment and cure, sent by mail free of charge. Address Howard Association, box P, Phila. Pa.
18 13

Morris, Wheeler & Co.,

1608 Market st., Philadelphia, Manufacturers & Dealers in
IRON, STEEL, AND NAILS,
Boiler and Plate Iron, Rivets, etc.
New York Office, 24 Cliff st. Works at Pottstown, Pa. 17 13

TO BUILDERS, CAR COMPANIES, and others, Jenkins' Patent Self Sash Hanging, for Dwellings, Railroad Cars, etc. State and County Rights for sale. Agents wanted. C. R. JENKINS & CO.,
17 4* No. 9½ N. 10th st., Philadelphia, Pa.

Banks, Dinsmore & Co.

Manufacturers of Standard Scales of all Varieties,
9th st., near Coates, Philadelphia. 17 13

SHAW'S "PARAGON"

LATHE TOOL

Is a tough Steel Stock, arranged for interchangeable Cutters, made of Diamond Cast Steel. See illustration in Scientific American of April 4th. Each cutter is shaped and tempered, and merely requires grinding, thus saving all dressing at the forge, and time in waiting. The Thread Cutters are milled to the proper angle, which is maintained until it is used up. Each tool will save its cost in men's time in a few days, and frequently in 24 hours of steady work. After a trial no one will be without them. Size No. 1, is ⅝x1½, price $2, complete. Extra cutters 25 cents. Manufactured by Patentee,
PHILIP S. JUSTICE,
No. 42 Cliff st., New York. No. 14 N. 5th st., Philadelphia.
16 4

ENGINE LATHES—A Specialty.—Send for circular. HARRINGTON & HASKINS,
16 4 Cor. 15th st. and Penn. ave, Philadelphia.

SLIDE LATHES, Iron Planers, Upright Drills, Bolt Cutters, Compound Planers, Universal Chucks, Gear Cutters, etc., at reduced prices. Address
15 13 CHAS. H. SMITH, 135 North 3d st., Philadelphia.

ALBRECHT, RIEKES & SCHMIDT.

MANUFACTURERS OF 1ST-CLASS PIANO FORTES
No. 610 Arch street,
15 13 Philadelphia, Pa.

MERRICK & SONS, Southwark Foundery,

PHILADELPHIA, PA.,

Sole Manufacturers, in Philadelphia, of William Wright's Patent
VARIABLE CUT-OFF STEAM ENGINE,
Regulated by the Governor. Sole Manufacturers in the United States of Weston's Patent
Self-Centering Centrifugal Sugar-Draining Machine.
Bartol's Patent
WROUGHT IRON RETORT LIDS.
Brinckmann's Patent
STEAM HAMMERS,
without valves. Address
MERRICK & SONS,
18 eow tf] 430 Washington Ave., Philadelphia, Pa.

Bridesburg Manf'g Co.,

Office No. 65 North Front Street,
PHILADELPHIA, Pa.,
Manufacture all kinds of Cotton and Woolen Machinery including their new
Self-Acting Mules and Looms,
Of the most approved style. Plans drawn and estimates furnished for factories of any size. Shafting and mill gearing made to order. 7 13* tf

---

New & Important Books

FOR

PRACTICAL MEN.

JUST PUBLISHED:

A Practical Guide for Puddling Iron & Steel. By Ed. Urbin, Eng. of Arts and Manuf. A Prize Essay read before the Association of Engs., Graduates of the School of Mines, of Liege, Belgium, 1865-6. To which is added A Comparison of the Resisting Properties of Iron and Steel. By A. Brüll. From the French, by A. A. Fesquet, Chem. and Eng. 8vo, cloth.....$1

A Hand Book of Practical Gaging, for the Use of Beginners, to which is added a Chapter on Distillation, describing the process in operation at the Custom House for ascertaining the strength of Wines. By J. B. Keene. 8vo.....$1 25

A Hand Book for Architectural Surveyors and Others engaged in Building. By I. T. Hurst. Pocketbook form, full bound.....$2 50

A Practical Treatise on Banking. By I. W. Gilbart. To which is added the National Bank Act, as now (1868,) in force. 8vo.....$4 50

Long-Span Railway Bridges; Comprising investigations of the Comparative Theoretical and Practical advantages of the various adopted or proposed Type Systems of Construction, etc. By B. Baker. Illustrated. 12mo.....$2

A Manual of Electricity, Practical and Theoretical. By F. C. Bakewell. 12mo.....$2

A History of American Manufactures from 1608 to 1867. By J. Leander Bishop, M.D. Illustrated by numerous portraits of leading manufacturers. 3 vols., 8vo.....$10

Practical Specifications of Works Executed in Architecture, Civil and Mechanical Engineering, and in Road Making and Sewering. By John Blenkam. Illustrated by 15 large folding plates. 8vo.....$9

A Practical Workshop Companion for Tin, Sheet Iron, and Copperplate Works. By L. J. Blinn. A new edition. 12mo.....$2 50

Analysis, Technical, Valuation, Purification, and Use of Coal Gas. By the Rev. W. R. Bowditch. Illustrated. 8vo.....$6 50

Practical Hydraulics. By Thomas Box. Illustrated. 12mo.....$2

Practical Illustrations of Land and Marine Engines, showing in detail the modern improvements in high and low pressure, surface condensation and superheating, together with land and marine boilers. By N. P. Burgh. Illustrated by 29 plates. Double elephant folio.....$21

Practical Rules for the Proportions of Modern Engines and Boilers for Land and Marine Purposes. By N. P. Burgh, Engineer. A new edition. 12mo.....$2

The Complete Practical Distiller. By M. L. Bym, M.D. A new edition. 12mo.....$1 50

The Essential Elements of Practical Mechanics. By Oliver Byrn. Illustrated. 12mo.....$3 63

Lectures on Coal Tar Colors, and on Recent Improvements and Progress in Dyeing and Calico Printing. Illustrated by numerous patterns of aniline and other colors. By F. C. Clavert. 8vo.....$1 50

The Practice of Hand Turning in Wood, Ivory, Shell, etc. By Francis Campin. Illustrated. 12mo.....$3

The Gas Works of London, with Process of Manufacture, Quantity, Cost, etc. By Zerah Colburn. 12mo.....75 cents.

The Water Works of London. Together with a Series of Articles on various other water works. By Zerah Colburn and W. Maw. Illustrated by 21 large plates. 8vo.....$4

Perpetual Motion; or, Search for Self-Motive Power during the 17th, 18th, and 19th Centuries. By H. Dircks, C.E. Illustrated by numerous engravings of machines, etc. 12mo.....$3 50

The Practical Millwright's and Engineer's Guide; or, Tables for Finding the Diameter and Power of Cog Wheels, Diameter, Weight, and Power of Shafts, etc. By Thomas Dixon. 12mo.....$1 50

The Practice of Photography. By Robert Hunt. 12mo.....75 cents.

Screw-Cutting Tables for the Use of Mechanical Engineers. By W. A. Martin.....50 cents.

Pocket-Book of Useful Formulæ and Memoranda for Civil and Mechanical Engineers. By G. L. Molesworth. Pocketbook form full bound.....$2

A Manual of Dyeing Recipes, for General Use. By James Napier. With numerous Patterns of Dyed Cloth and Silk. 12mo.....$3 75

Manual of Electro-Metallurgy, Including the Application to Manufacturing Processes. By Jas. Napier. 4th American edition. 8vo.....$2

Gleanings from Ornamental Art, in Every Style. Drawn from examples in the British, South Kensington, Indian, Crystal Palace, and other Museums, the Exhibitions of 1851 and 1862, etc., etc. Illustrated by 100 exquisitely drawn plates. 4to.....$15

Painter, Gilder, and Varnisher's Companion. Including Painting, Varnishing, Glass Staining, Graining, Marbling, Sign Writing, Gilding on Glass, Coach Painting and Varnishing, etc., etc. A new edition 12mo.....$1 50

Records of Mining and Metallurgy. By J. A. Phillips and John Darlington. Illustrated. 12mo..$2

Parks and Pleasure Grounds; or, Practical Notes on Country Residences, Villas, Public Parks, and Gardens. By C. H. J. Smith. 12mo.....$2 25

The Modern Practice of Photography. By R. W. Thomas. 8vo.....75 cents.

☞ The above, or any of my Practical and Scientific Books will be sent free of postage, at the publication price, to any address.

☞ My new and enlarged Descriptive Catalogue, 56 pages, 8vo, will be sent, free of postage, to any one who will favor me with his address.

HENRY CAREY BAIRD,
Industrial Publisher,
18 1] 406 Walnut street Philadelphia.

Merchandise Tags,

Patent Direction Labels, Shipping Cards, etc. Samples sent on application. DENNISON CO.,
15 4 36 South Third st., Philadelphia, Pa.

KENSINGTON IRON WORKS.—Stationary and Portable Engines of any required size made to order. Also, Locomotive, Flue, Cylinder, & Marine Boilers. Tug Boats and Propeller Yachts of required length, breadth of beam, and Power.
15 8 A. L. ARCHAMBAULT, Philadelphia, Pa.

FIRE-PROOF CONSTRUCTION.—Gilbert's Corrugated "Iron Ceiling" for fire-proof buildings. Office No. 429 Walnut street, Philadelphia. Wrought Iron Beams of all sizes. All kinds of Corrugated Iron. Fire-proof Buildings constructed.
14 13 JOS. GILBERT, Superintendent.

Cedar Vats, Tanks, and Reservoirs,

For Brewers, Distillers, Dyers, Chemists, Manufacturers etc., Public and Private Buildings, etc., etc.
GEO. J. BURKHARDT & CO.,
8 13*] Bottonwood, below Broad st., Philadelphia, Pa.

POWER LOOMS. Improved Drop Box

Spooling, Winding, Beaming Dyeing, and Sizing Machines, Self-Acting Wool Scouring Machines, Hydra Extractors Also, Shafting, Pulleys, and Self-Oiling Adjustable Hangers, manuf'd by THOS WOOD, 2106 Wood st., Phil'a, Pa.
6 13*

RAILROAD ACROSS THE CONTINENT.

GRAND SAFE INVESTMENT.

The **CENTRAL PACIFIC RAILROAD** COMPANY are authorized by Acts of Congress to construct, with the aid and supervision of the United States Government, the Western and principal portion of the National Trunk Line between the Pacific coast and the Mississippi Valley. They have built by far the most difficult and expensive portion of their Road, and have an unprecedented working force extending the track across the Salt Lake Basin. By the close of 1868, it is expected they will have 400 miles in full operation; and that the

ENTIRE LINE WILL BE COMPLETED IN 1870.

More than **TWENTY MILLIONS OF DOLLARS** have been expended in the work, and the CONSTRUCTION RESOURCES are ample for the remainder. They consist of

1. UNITED STATES BONDS, to the extent of $35,000 per mile, average, delivered as the work progresses.

2. FIRST MORTGAGE BONDS, to the same amount, issued also according to the progress of the road, and having the preferred claim—superior to that of the Government.

3. GRANT OF PUBLIC LANDS along the route, 12,800 acres per mile, or nearly ten million acres in all, which are now selling at the minimum rate of $2 50 per acre.

4. CAPITAL STOCK of $20,000,000, of which $5,000,000 is subscribed and paid on the work done.

5. CASH RESOURCES, comprising donations from California sources, amounting to $1,250,000, Net Earnings, etc., 1865 to 1870, $6,500,000, making a total of more than

Seventy Millions upon the first 726 Miles.

The Company now offer for sale through us, at their

Par Value and Accrued Interest,

in currency, a limited amount of the

FIRST MORTGAGE BONDS,

bearing six per cent. per annum—both INTEREST AND PRINCIPAL being explicitly made **"PAYABLE IN GOLD COIN,"** conformably with the specie laws of the Pacific States.

The Bonds are of $1,000 each, with semi-annual gold coupons attached, payable in July and January.

☞ The Company reserve the right to advance the price *at any time;* but all orders actually *in transitu* at the time of any such advance will be filled at present price. They are believed to combine greater attractions of safety, reliability and profit than any other securities now offered, and are recommended to persons seeking desirable steady investments. We receive all classes of Government Bonds, at their full market rates, in exchange for the Central Pacific Railroad Bonds, thus enabling the holders to realize from 5 to 10 per cent. profit, and keep the principal of their investments equally secure.

Orders and inquiries will receive prompt attention. Information, Descriptive Pamphlets, etc., giving a full account of the Organization, Progress, Business and Prospects of the Enterprise, furnished on application. Bonds sent by return Express at our cost.

FISK & HATCH,

Financial Agents of the C. P. R. R. Co.,

No. 5 Nassau St., New York.

Offices of the Company,

No. 54 William Street, New York.
Nos. 56 and 58 K Street, Sacramento, Cal.

Bonds for sale by

BREWSTER, SWEET & CO., Boston.
BOWEN & FOX, Philadelphia.
JAMES T. BRADY & SONS, Pittsburg.
LUNT, PRESTON & KEAN, Chicago.

Subscriptions received through Banks and Bankers generally.

☞ All descriptions of **Government Securities Bought, Sold, or Exchanged,** at our office, and by Mail and Telegraph, at **MARKET RATES.**

☞ **Seven-Thirty Notes** converted into the New Five-Twenties, or any other class of Government Bonds.

☞ **Accounts of Banks, Bankers,** and others received, and favorable arrangements made for desirable accounts.

☞ **Gold, Coupons,** and **Compound-Interest Notes** Bought and Sold.

☞ Miscellaneous **Stocks** and **Bonds** Bought and Sold, at the Stock Exchange, on Commission, for Cash.

☞ Dealers and Investors out of the City desiring to make negotiations in any of the above, may do so through us by mail or telegraph, as advantageously as though personally present in New York.

FISK & HATCH,

BANKERS AND DEALERS IN GOVERNMENT SECURITIES,

No. 5 Nassau Street, NEW YORK.

WANTED—A Second-hand Paper-cutting Machine. Sheridan's Patent. Address, with price particulars, Box 1124, New York Postoffice. 1*os

STEAM ENGINES—all Sizes and Kinds. Send for Circulular. H. M. AMES, Oswego, N. Y., or No. 60 South Canal st., Chicago, Ill. 1*os

Asbestos Cement

FOR REPAIRING LEAKS IN ROOFS of all kinds. 10 lb. pails $1. Sent by express on receipt of price. H. W. JOHNS, 78 William street, New York. 1os

ASBESTOS

ASBESTOS ROOFING.
ASBESTOS ROOF COATING.
ASBESTOS CEMENT.

ALL who are familiar with the nature of of the indestructable fibrous mineral, Asbestos, will appreciate its value for above purposes. Others can learn full particulars from our descriptive circulars.
H. W. JOHNS, 78 William st., New York,
Patentee & manufacturer of Improved Roofing Materials. Established 1858. 1os

THE STATE RIGHTS of Mueller's Stove Handles and Lifters will be sold for New York, New Jersey, or any of the New England States. For further information see illustration in Sci. Am., Vol. XVI., page 21, and address J. U. MUELLER, Detroit, Mich. 1os

A SITUATION WANTED by a man educated in Prussian Schools, with 20 years' experience in Mining, Constructing and Managing Blast Furnaces, Rolling Mills, and Cast Steel Works. Reference can be given. Address P. W., P. O., Chalybes, Conn. 1os*

A PERFECT SAFETY VALVE.—For the Best Protection of Boilers, use the Burley Valve, as it will operate for the want of water as well as over pressure. It being almost as simple in construction as the ordinary valve, has no float or fusable metal to get out of order, and requiring no future expense. Address, for illustrated circular,
BURLEY & CATLOW,
Corner of Liberty and Clay streets,
1os* Cincinnati, Ohio.

Pressure Blowers

OF ALL SIZES, for purposes where a blast is required. For particulars and circulars, address B. F. STURTEVANT, No. 72 Sudbury st., Boston, Mass. 17 ostf

Factory, Trenton, N. J. Office, No. 2, Jacob st., N. Y. 14 tt

FREE. Our New Catalogue of Improved STENCIL DIES. More than $200 A MONTH is being made with them S. M. SPENCER & CO., Brattleboro, Vt. 6ostf

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven. 5os tf

Ready Roofing

READY ROOFING.—The first customer in each place can buy 1000 feet of Roofing at half price—$25. Samples and circulars sent by mail. Ready Roofing Co., 81 Maiden Lane, New York. 12 tf os

14 13* os

Reynolds'

TURBINE WATER WHEELS

And all kinds of
MILL MACHINERY.
Send for Illustrated Pamphlet.
GEORGE TALLCOT,
96 Liberty st., New York.

WHEATON'S OINTMENT cures the Itch
WHEATON'S OINTMENT will cure Salt Rheum.
WHEATON'S OINTMENT cures Old Sores.
WHEATON'S OINTMENT cures all diseases of the Skin.
Price 50 cents;—by mail 60 cents. All Druggists sell it.
WEEKS & POTTER, Boston, Proprietors. 2 tf os

SAWS. SAWS. SAWS.

Attention, Lumbermen!

HENRY DISSTON, OF PHILADELPHIA,

IS MAKING BOTH INSERTED AND SOLID-TEETH SAWS THAT ARE PREFERRED, BY THOSE WHO USE THEM, ABOVE ALL OTHERS.

☞ For Particulars send to Factory, 67 and 69 Laurel street, Philadelphia, Pa.

BRANCH HOUSE, Lake street, Chicago, Ill. [25 13* eow os

$10 TO $20 A DAY GUARANTEED.

GOOD Agents wanted to introduce our new **Star Shuttle Sewing Machine**—Stitch alike on both sides. The only first-class, low-priced machine in the market. We will consign Machines to responsible parties, and employ Energetic Agents on a Salary. Full particulars and sample work furnished on application. Address W. G. WILSON & CO., Cleveland, Ohio, Boston, Mass., or St. Louis, Mo. 13 6os

WIRE ROPE.

Manufactured by
JOHN A. ROEBLING
Trenton, N. J.

FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 17 5*os

Band Saws and Files.

FRENCH BAND SAW MACHINES and SAWS—
For Sawing Logs and Reslitting. Also, for Light and Heavy work. G. GUEUTAL,
1*os 39 West Fourth st., New York.

FINANCIAL AGENCY.

PATENTS of Practical Value and Importance Negotiated, Capital procured for Solvent and Reliable Incorporated Companies, Merchants, and Manufacturers, address
E. TIFFANY & CO.,
Financial and Commercial Agents,
4 Wall st., N. Y.

References:—E. Tiffany & Co. are an Honorable and reliable firm.—E. D. Tiffany, Pres't First National Bank, Hartford, Conn.; H. W. Slocum, Director M.U.Ex. Co., 365 Broadway; R. J. Capron, of Scott, Capron & Co., Bankers, 58 B'd'y; Stephen Crowell, Pres't Phenix Insurance Co., 139 B'd'y; Hon. S. S. Cox, 122 B'dway; J. Bryce, of Wm. Bryce & Co., wholesale hardware, 29 Chambers st.

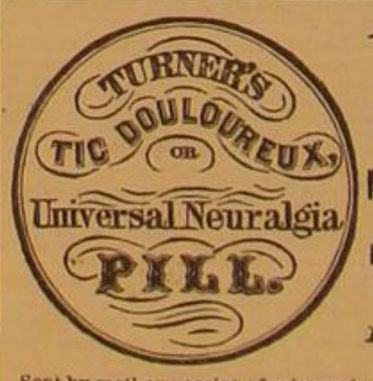
IRON & WOOD WORKING MACHINERY

TURBINE WATER WHEELS.
LUCIUS W. POND,
98 Liberty st., N. Y., and Worcester, Mass.
18 tf

FOR SALE—Rights to Manufacture the Simplest and Best Cider Mill yet invented. It has carried off the first prize wherever exhibited. For information address H. SELLS, Vienna, C. W.,
18 tf Or, John Alexander, Shelby, Ohio.

INDELIBLE PENCIL, for Marking Linen. Will mark 1,500 articles. Used like a lead pencil. Will not blot. 1,000,000 sold. Every housekeeper wants it. Warranted. Money returned if not satisfactory. Sample in neat case, 50c.; 3 for $1; 1 doz. for $3 50. Agents Wanted, $10 per day easily made. Address PENCIL CO., Hinsdale, N. H. 18 3

I AM WILLING TO SELL ENTIRE OR State Rights for the sale and manufacture of my Improved Window Shade Fixture, patented through the Agency of Munn & Co., and illustrated in the Scientific American of June 29, 1867. Agents wanted every where to dispose of Rights and canvas for orders. For particulars apply to the patentee,
14 4 os eow WM. BROWN, Bristol, Conn.



A SAFE, CERTAIN, AND Speedy Cure FOR NEURALGIA, AND ALL NERVOUS DISEASES.

Its Effects are Magical.

Sent by mail on receipt of price and postage.
One package.....$1.....Postage 6 cents.
Six packages..... 5..... " 27 cents.
Twelve packages.. 9..... " 48 cents.
It is sold by all wholesale and retail Dealers in Drugs and Medicines throughout the United States, and by
8 26 eow os] TURNER & CO., 120 Tremont st., Boston.

AMERICAN HOUSE, Boston, Mass. The very important and extensive improvements which have recently been made in this popular Hotel, the largest in New England, enable the proprietors to offer to Tourists, Families, and the Travelling Public, accommodations and conveniences superior to any other Hotel in the city. During the past summer additions have been made of numerous suites of apartments, with bathing rooms, water closets, etc., attached; one of Tufts' magnificent passenger elevators, the best ever constructed, conveys guests to the upper story of the house in one minute; the entries have been newly and richly carpeted, and the entire house thoroughly replenished and refurnished, making it, in all its appointments, equal to any hotel in the country. Telegraph Office, Billiard Halls and Café on the first floor. LEWIS RICE & SON, Proprietors. 8 6* os eow

WATERPROOF PAINT.—The undersigned are confident of having the best article of paint that has been introduced to the public. The composition was invented in 1860, and has been exposed to the action of the weather ever since, and has become as hard as stone. It was originally intended to prevent railroad bridges from taking fire, also to preserve their timber from rotting. It is waterproof; a little paper box painted inside with it will hold water like a saucer, the paint not being injured by it after being kept in three months. It is the best roofing material, and can be applied to shingle roof with a paint brush, making it fire and waterproof, and likewise to asphalte felting producing the same result. It is the best paint for brick walls, coating them with a coat of stone, thereby preventing mortar being washed out, and the injurious action of the weather on the brick. It is likely that it will be found the best paint for shipping, adding to its being waterproof that important item of fire proof.
HECKEL & EICHINGER,
Box 568, Decatur, Ill.

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

THE
HARRISON BOILER

HAS ABSOLUTE SAFETY!
HAS GREAT ECONOMY IN FUEL
HAS DURABILITY AND FACILITY OF REPAIR.

Hundreds of these boilers have now been in use for years, giving perfect satisfaction. For descriptive circular and price apply to

JOHN A. COLEMAN, Agent,
58 Kilby street, Boston, Mass.
J. B. HYDE, Agent,
Office No. 9, at 119 Broadway, New York, or to
THE HARRISON BOILER WORKS,
9 13*] Gray's Ferry Road, Philadelphia, Pa.

TO INVENTORS.—Any Person having an invention or patent, and lacks money, can obtain assistance, if approved of, by applying to or addressing with particulars, H. J. FOX,
18 5*os 221 South 5th st., Philadelphia, Pa.

BROOK'S PAT. PARAFFINE INSULATOR WORKS,

No. 22 South 21st street, Philadelphia. Wire insulated with this insulator, can, like the conductor in a well-insulated sub-marine cable, or the Leyden Jar, be charged and discharged, in rain and fog, the damp air itself, which has hitherto by some been supposed to conduct, serving as the dielectric,
18 2*os

Industrial Works.

MACHINISTS' TOOLS AND EQUIPments for Railroad, Iron Ship Building, and Gun Shops.
STEAM HAMMERS,
Turn Tables, Shafting, Bolt Cutters, Cotter and Key-Seating Machines, Cranes, Cupolas, etc.
9 13os*] BEMENT & DOUGHERTY, Philadelphia, Pa

DRAWING INSTRUMENTS.—A Manual of 112 pages describing all Mathematical Instruments and Drawing Materials, their use, and how to keep in order. Sent free on application by JAS. W. QUEEN & CO., Mathem'l Inst't makers, 924 Chestnut st., Philadelphia. 11 10*os

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY.
Works, Paterson, N. J.; Warerooms, 4 Dey st., N. Y., Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Rope & Oakum Machinery: Snow's & Judson's Governors; Wright's Patent Variable Cut-off & other Engines. 9 tf

FRENCH BURR MILLSTONES,
BOLTING CLOTHS,
Of the very best qualities imported,
Supplied Cheaper than any
other house in the country by
GEO. TALLCOT,
14 13* 96 Liberty street, New York.

FUEL Economized and Power Increased by Carvalho's Pat. Steam Super-Heater, easily attached to boilers, gives perfectly DRY steam, remedies "priming." Address H. W. BULKLEY, Gen'l Ag't, 70 Broadway, N.Y. 9 13*

WANTED—A Competent man would like to obtain a situation as foreman of a Machine Shop. Can give first-class recommendations. Would prefer going into the country. Address H. STILLING, 51 Courtlandt st., cor. of Greenwich, New York. 1*

WOODWARD'S COUNTRY HOMES; 150 designs, $1 50 postpaid. GEO. E. WOODWARD, Architect, 191 B'd'y, N.Y. Send stamp for catalogue of books on Architecture. 18 tfos

ONLY TEN MORE AGENTS WANTED to sell Richmond & Hoster's Silver-Plating Fluid. 1 doz. Bottles sent by express for $3. Address RICHMOND & HOSTER, Seneca Falls, N. Y.

SHAW'S CHEMICAL ELECTRO SILVER-PLATING FLUID makes worn-out plated-ware as good as new. Samples sent by mail on receipt of 25 cents to pay for packing and postage. Address J. SHAW, Chemist,
30 Elm st., Bridgeport, Conn. Agents wanted everywhere. 18 4

PORTABLE FOOT LATHES with Slide Rest and Fittings. Acknowledged Best and Cheapest. Address S. K. BALDWIN, Laconia, N. H. 18 9*eow

WATER-WHEEL GOVERNORS,—First-Class Line Shafting and Pulleys. Address
18 tf GREENLEAF & CO., Indianapolis, Ind.

STEAM-BOILER SUPPLY PUMP AND Wrought Shafting for sale very cheap. An excellent strong boiler, 24 feet long, 42-in. diameter, with two 14-in. flues. Also, a Vertical Pump, cast frame, with two pulleys, and 50 feet wrought iron shafting, 2½-in. diameter. Apply to J. LOMAS, Fishkill Landing, N. Y. 1*

MANUFACTURERS, DEALERS, AND others, having new and second hand machinery and tools for sale, are informed that a Machinery Intelligence Company is opened at No. 1 Center street, where it is designed to keep a complete record of everything in the machinery line in the market, to facilitate buyers. No commission asked. Send for circulars. Subscribers please send list. 1*

ATTENTION! ATTENTION! ATTENTION!
EL PROGRESO, a scientific newspaper, with a large circulation throughout the West Indies, Spain, Mexico, and the Spanish American republics, published by the PROPAGANDA LITERARIA, No. 100 Habana street, Havana, Cuba. Advertisements of machinery, implements, apparatus, medicines, drugs, etc., inserted at moderate rates. Address J. L. ALCOVER, Box 1,429, P. O., N. Y.

MANUFACTURERS—And others using Steam Engines, can, by applying the INDICATOR, ascertain the condition of their Engines; the power required to do their work, or any portion thereof; the economy of fuel expended, when compared with power developed. The undersigned makes a specialty of this branch of engineering, and will wait on any party who desires his services. Instruments furnished and instruction given. F. W. BACON,
18 tfeow Consulting Engineer, 84 John st., N. Y.

ENGINE WANTED IMMEDIATELY, of three to four horse-power. Those having new or good second-hand for sale, please address H. S. AKINS, Speedsville,
1* Tompkins Co., N. Y., giving particulars and price.

LUBRICATOR For Sale Cheap, the Inventor having no time to attend to it. Apply to the Engineer on board of the ferryboat Elizabeth, foot of Liberty st., New York. 1*

SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XVIII.—No. 19. [NEW SERIES.]

NEW YORK, MAY 9, 1868.

$3 per Annum [IN ADVANCE.]

Device for Removing Seeds and Pits from Fruit.

The preparation of fruit for culinary purposes or preserving is a monotonous and tiresome labor, at least the work of removing the seeds or pits. To facilitate the operation and render the task less irksome is the object of the inventor of the neat little implement shown in the engraving, an object we have found by trial it successfully accomplishes. Its operation is very rapid and its results satisfactory. It never fails to remove the pits from cherries and the seeds from raisins, grapes, cranberries, etc., leaving the fruit in excellent condition without crushing or bruising it.

THE ILLINOIS CHERRY STONER.

The machine is made, with the exception of the platform, A, of the receiver and the gutter, B, wholly of wrought iron, so there is no danger of breakage. There are no springs or complicated parts to get out of order and it is made in a substantial manner. The device is screwed to the edge of a table in the same manner as a "sewing bird" or other similar implements, so that it may be attached or removed instantly. The fruit is dropped into the receiver, A, Fig. 2, which, when the implement is attached to a table, is inclined toward the operator, and it rolls down the grooves to the recesses, which hold it in place to be operated upon. The hand then lifts forward the handle, C, connected, with the hooked forks, to a pivot. The ends of the forks or stoners are split and pointed, the points diverging from the center. These engage with the seeds or stones in the fruit and force them through the apertures in the bottom of the recesses in A. As the forks are raised the fruit adheres to them, and is raised as seen in the main figure, and thrown off by the plate, D, dropping into the gutter, B, and being thus discharged into a dish, the seeds dropping through the recesses in A to another vessel placed to receive them. Pierced glands of leather or other suitable material under A prevent the return of the seeds should they become attached to the forks.

This little machine leaves the cherries after being stoned round and plump, and from its rapidity of operation does not waste the juice. Patented by George Geer, April 9, 1867. For further information address Geer & Hutchinson, Peoria, Ill.

Telegraph Insulation.

C. F. Varley, well known for his skill as an electrician, and especially for his services in connection with the Atlantic cable, has lately obtained the following patent:

Insulators for telegraphic wires are usually made with an iron pin, coated with what is known as vulcanite, or hard vulcanized india rubber, and secured by means of plaster Paris, or other cement, inside of a porcelain or other earthenware cup inverted. As heretofore made it has been found that the vulcanite covering is liable to be porous, and full of what are known as blow-holes, and that the iron or steel pin is liable to rust, by reason of the presence of the vulcanite covering, and that the accumulation of the rust is liable to crack the vulcanite covering.

And the first part of said invention relates to a method of preventing the pin from rusting, and consists in coating the iron or steel pin with zinc, and then coating the zinc with tin, or an alloy of tin, preparatory to applying the vulcanite covering. The zinc is applied in the well-known manner of galvanizing iron, and the zinc is coated with tin, or an alloy of tin, by dipping in a bath of molten tin, or alloy of tin, in the same mannar as sheets of iron are usually tinned; and after being so tinned, the preparation of india rubber, or other vulcanizable gum, mixed with sulphur, is applied in the green or plastic state, and then subjected to the vulcanizing heat to be hardened, in manner well known to manufacturers of vulcanite. When so made, the vulcanite will be found to be solid and without blow-holes, and the pin will not rust, however much it may be exposed. The cement used for securing the pin in side the inverted cup is more or less porous, and the presence of such pores renders the insulation imperfect.

And the second part of said invention, which relates to a method of avoiding such defect, consists in saturating the cement with paraffine wax, to fill up the pores. In practising the second part of said invention, the iron pin, with its covering of vulcanite, is inserted in the cup, without touching any part of the surface thereof except the bottom of the inside of the inverted cup, and the intervening space is filled with cement, made, by preference, of one part of plaster Paris and two parts of Portland cement, but other cement may be used, such as plaster, or Roman or Portland cement alone. After the parts have been united by the cement, the whole is put in a bath of melted paraffine wax, at a temperature of about 224° Fahr., and there left until all bubbling ceases, which indicates that all the water has been expelled from the cement, and that the pores have all been filled. In this way all the pores and interstices are filled with paraffine wax, thereby rendering the insulation more perfect, and as there are no pores into which moisture can lodge, there will be no danger of fracturing the parts by the expansion of water in freezing, as heretofore.

The third part of this invention consists in covering the telegraph wire itself, at the point of support, and for a distance of a foot or more on each side, with a covering of hard rubber, similar to that placed on the insulator. This is carried into effect in the following manner, viz: First, pieces of ordinary galvanized telegraph-wire are tinned, and then covered with hard vulcanite, in the same manner that the insulator pins are covered, as above described. Secondly, these pieces of wire are spliced into the telegraph-wire at each point of support by means of the usual soldered joints. Prior to being used, these pieces are boiled in paraffine wax, and from time to time, when their surface becomes damaged by the solar actinic rays and exposure, they are washed and rubbed with paraffine oil or coal-tar naphtha, which renews the insulating power of the surface.

These insulators are principally useful where the wires are exposed to the spray of the sea, the rain washing them clean. This oil is very useful with all kinds of insulators, for the purpose of renovating the surface.

Improvement in Coating Metals.

John D. Grüneberg and Samuel H. Gilbert, of Spring Mills, N. J., have patented the following: "Hitherto it has been customary to cover sheet iron and copper, and probably other hard metals, with tin or alloys, by 'dipping' the former in acid, and then in a solution of the tin or alloy. The disadvantage of this process is that only small sheets of metal can thus be coated or plated, because, in preparing large sheets, it was found that a considerable portion of the surplus covering or plating would harden before it had run off from the lower end of the sheets, so that only part of said sheets would possess the proper thickness or surface. Our invention is specially intended to remedy this. We have found that long or large sheets of metal can be uniformly coated or plated in a simple manner, so that an article of metal is produced which possesses all the advantages of pure tin, and at a much less expense. If the sheets of tin or alloy are spread or laid upon sheets of hard metal so as to entirely overlap them, and the two sheets be subjected to rolling under a heavy pressure, the friction thereby will heat the metals in passing through the rolls, and cause them to unite firmly and with a uniform surface, so as to produce a superior article of metal.

"In carrying out our invention, we take blocks or sheets of any of the aforementioned hard metals, and roll them, in a cold or heated state, until they assume a certain thickness. We then make an alloy of either of the following: One quarter tin, one quarter copper, and one half lead, more or less; or six parts tin, one, antimony; or fifty parts tin, four, antimony, one, bismuth; or, fourteen parts tin, one twenty eighth part zinc or copper, or one half of each of the latter ones; or pure tin, alloyed with as much of one of the above-named metals, or any other metal which will give it more stiffness and durability than it has in its natural state; or we use pure tin itself. A block of the tin, or tin or other alloy, is now cast in a mold of suitable size, which block is then passed through highly-polished rollers, so as to be reduced to a proper thickness to answer the purpose of common plating. The thickness may vary from one to thirty-five per cent of the original thickness of the block or sheet of hard metal selected. The strips thus produced are then severally spread or laid upon a smooth, level table. One of the aforementioned blocks or sheets of hard metal is now laid upon one of the strips of tin or alloy, which strip is then lapped over the former, so as to entirely cover it. Care must be taken to rub it smoothly, in order to prevent the formation of air blisters or wrinkles. The compound sheet or block thus constituted is now passed between highly-polished rollers under heavy pressure, whereby the metals become quite hot in passing through, thus causing them to firmly unite, and evenly, in one solid sheet, having either the tin or alloy, or other metal, for the outer coating.

"Instead of the above process, we prepare a solution of one pound of muriate or nitrate of tin, and ten gallons (or eighty pounds) water (98° Fah.), more or less. Into this bath we dip the desired sheet of hard metal for the space of five to twenty minutes, more or less, when the sheet will be found sufficiently covered with pure tin. It may then be polished or rubbed bright with soft cloth or leather. It will be found that steel or iron coated with tin or alloy can be used for cooking utensils, and for every article in which sheet tin is employed. The surface being entirely uniform, it cannot be affected by dampness, and thus serves to prevent rust.

"Our process prevents oxidation or corrosion in zinc. We can produce very large sheets thereof, when, by the process now employed, it can only be produced in small pieces. For lining bath tubs, water cisterns, and the like, our zinc will be found invaluable. For photographic and lithographic purposes, we interpose between the sheets of covered or plated zinc suitable pieces of tissue or other paper, muslin, or any equivalent fabric, and then subject them to another pressure; or we pass the metal between rollers having a slightly-roughened surface, so that the impression of the paper, fabric or rollers will be imparted to the metal, and cause its surface to assume a certain roughness necessary to photographic, lithographic, printing, or any other ornamental purposes.

"The uses to which our invention can be applied are numerous; generally speaking, to all purposes requiring stiff metal, which shall neither corrode, crack, nor be affected by heat or cold, and also to possess the advantages of pure tin."

Manufacture of Whiting and Paris White.

Take good limestone—though I believe any good lime will serve as well—and burn it in a kiln in the ordinary manner. Then slack the quicklime thus produced, and add so much water as will form a fluid having a consistency like cream. Let this stand for several hours, to allow the foreign and gritty matter to subside. Then lead it into a tank, and blow up through it carbonic acid gas for some days or weeks, constantly agitating it by a wheel, after the fashion of a dairy churn, until the water ceases to give any appreciable alkaline reaction to the taste. The particles of lime are now again fully supplied with carbonic acid, and are then carbonate of lime, substantially the same article, chemically, as the rock in the earth, but exceedingly comminuted and void of foreign matter. It remains now to dry the mass by ordinary means, and the result is a whiting or Paris white, made without

grinding, yet as fine as dissolving in water can make it. This may be used for all the purposes for which ordinary whiting or Paris white is used, with the same or a better effect.

Recently patented by Wm. W. Chipman, of Brooklyn, N. Y.

EDITORIAL CORRESPONDENCE.

Other Characteristics of Venice—Gondolas—The Plains of Lombardy—Great Battle Fields—Milan as a City—The Carnival—The Duomo with its Marble Statues—A Gorgeous Tomb The Splendid Monastery near Pavia—The Monks and their Occupations.

Turin, March, 1868.

In dull, rainy weather, Venice is the place above all others within my knowledge where a sublime melancholy could be cultivated to great advantage. It is one of those peculiar spots that needs all the sunshine it can get to dispel the heaviness of death which hangs about its decaying grandeur. I met in Rome a jolly New Yorker who was compelled by sickness in his family to remain several weeks in Venice during the rainy season, and in answer to the question how he enjoyed it, he declared that he "felt like a drowning rat all the time." We considered ourselves, therefore, very fortunate to have passed our time there cheered by the presence of warm sunlight. Under such favoring circumstances I know of no situation more luxurious than to take a gondola and float lazily about the canals and lagoons of this most singular city, observing its many quaint old palaces, beautiful even in their fading glory, and the numerous water craft which flit about the waters, doing the business and pleasure of the people. Many persons whose knowledge of Venice consists in what they have read, are apt to entertain the idea that it is a city whose streets are all canals, and that no communication is had from point to point except by boats. This is an error. It is true that along the margin of the grand canal, and on many of the smaller ones, there are neither streets nor sidewalks. Nevertheless, I think there is scarcely a building in the whole city which cannot be reached either through some narrow, dingy street or by a foot walk. I suppose it is one of the most intricate cities in the world to pass through on land. A person not accustomed to its maziness would soon get bewildered by the numerous bridges, alleys, crooks, and turns, which present themselves at every point. There was some novelty in taking a boat to go to church, but as every thing is novel hereabouts, one soon gets accustomed tc strange things. Many of the churches of Venice are exceedingly rich in fine sculpture and painting, chiefly the works of Venetian masters, and of whom Titian and Canova were the acknowledged leaders. The picture gallery contains Titian's first work, "The Visitation of Elizabeth," executed when he was but fourteen years old, also his last picture, a Deposition, painted when he was ninety-eight, though he was unable to finish it. He was a master of the art of painting the female form divine, and his Venuses rank among the most wonderful works of art in Europe. By the assistance of his mistress to serve as a model, Titian could supply the church and the world with pictures of Madonnas, saints, and sinners—it was all the same to him.

A Venetian gondola is a long, black, rakish-looking craft, which glides over the water with the grace and dignity of a swan. They are uniformly painted black, with a black cloth housing fastened over the little saloon, which affords a most cosy retreat from the elements. In the olden time, when extravagance was carried to a high pitch, the gondolas were painted and decorated according to the whims and taste of their owners; but at the present time custom, if not law, requires that they shall be of uniform color, simply for the reason that if this seemingly small matter of choosing a color were to be left to the discretion of the owners, they might indulge a variety of tricks and fancies for the purpose of catching customers, to the injury of those less able to compete with them. A gondola and one gondolier costs twenty cents for the first hour, and ten cents for each subsequent hour. A gondola with two gondoliers can be hired for twelve francs per day—equal to $2.40 in our money.

We chanced to leave Venice the day after the close of the carnival. It was estimated that at least three thousand people were to take the first morning train, therefore there was an unusual stir. The canals were literaily alive with gondolas and other small water craft, hurrying passengers and trunks to the station. It was very interesting to notice with what skill they pass each other in the narrow and tortuous canals which thread their way through every part of the city. Before turning a corner, and to prevent collisions, which rarely ever happen, it is the habit of the gondolier to utter a sharp cry to give notice of his approach, which is quickly responded to if another is coming in the opposite direction. There is nothing like incivility or even real rudeness between the gondoliers, although to one not familiar with the language their colloquies may sometimes appear to be sharp. Upon arriving at the station the scene was one of great confusion, which was greatly increased by the fact that Venice, retaining its ancient right of a free port, all baggage is subject to examination before being allowed to pass beyond the city limits. Seats, however, were somehow provided for all, and as is usual at nearly all the European railroad stations, the passengers are seated about five minutes before the train starts, during which interval everything is so silent and still it is difficult to believe that thousands of people are impatient for a start.

The route to Milan carries the tourist through Padua, Verona, Vicenza, Brescia, and Bergamo, all ancient cities of interest, but for the want of time I could not stop to visit them. I was, however, much interested in getting a good view of the fortress of Peschiera, situated on the Mincio, where it issues from the Lake of Garda. It was one of the famous *quadrilaterals* of the war of 1859, and is but a short distance from the battle field of Solferino. It will be recollected that this fortress was invested after the victory of Solferino, but the siege was cut short by the peace of Villafranca.

I think it would be difficult to find a section of country finer than that which lies between Venice and Turin, and especially that portion of it known as the plains of Lombardy. These plains derive their fertility in a great measure, no doubt, from the waters which flow down the Alps into and through the beautiful lakes of Garda, Como, and Maggiore, which constitute receiving and distributing reservoirs. The country is covered by a network of canals, which are employed for the transportation of merchandise, having numerous off shooting rivulets for irrigating the soil. Mulberry trees and silk, indian corn and rice, wheat, potatoes, and cheese, besides the vine, olives, and chestnuts, and a great variety of fruits, are its abundant productions. Ir is a country worth fighting for, and has been a bone of contention since the invasion of the Lombards, or Longbeards, in 568. Its cities were among the most splendid and populous in Europe, and its history is written over in blood shed upon the fields of Novara, Pavia, Cremona, Lodi, Marengo, Magenta, and Solferino. So terrible has been the destruction visited upon some portions of this fair country, that when Frederick Barbarossa left Milan, in 1162, its inhabitants were all scattered, and nothing was left to mark its site but shapeless ruins and the old church of St. Ambrose, which now exists as among the most venerable Christian edifices in Italy.

Milan is one of the most beautiful cities in Europe, having broad streets, fine parks, drives, and promenades, which are kept with scrupulous neatness. The Milanese pride themselves upon having the cleanest city in Europe, and are disappointed if strangers fail to recognize the fact. It is a miniature Paris in the general aspect of its streets and fine shops, and it may be interesting for the ladies to know that at one time Milan led the fashionable world, especially upon the all absorbing topic of bonnets, and the word milliner is a namesake of the fair city.

The King Victor Emmanuel contrives somewhat shrewdly to propitiate the favor of the larger cities by quartering branches of the royal family among them. The crown prince Humbert, who is soon to marry his cousin Margaret, the daughter of the king of Saxony, resides permanently in Milan, and strives to keep up a small court. The prince Amadeo resides at Naples, and other members of the family so far as their numbers will admit, are scattered about other parts of Italy, while the poor king lives all alone at Florence. The Church of Rome forbids intermarriages between cousins, therefore, in order to bring about this marriage, it became necessary to apply to the Pope for a special dispensation, which the papers declare was awarded upon the payment of twenty thousand francs. The stock of royal boys and girls in Europe has nearly run out, and there are fears that the blood may become corrupted by a resort to plebian connections.

By a special indulgence of St. Ambrose—patron saint of Milan, who appears to have had an eye in this matter toward the business interests of its inhabitants—they are permitted to extend their carnival three days beyond the time allotted to its celebration in other cities. A carnival in Italy is an outburst of popular festivity, which is allowed to manifest itself by unusual license for several days previous to the lenten fast, when every body is expected to sit down hungry, in sackcloth and ashes. We happened to arrive in Milan the day previous to the opening of the grander ceremonies, for which unusual preparations had been made, hoping thereby to draw crowds of strangers and the country folks. During the afternoon the streets swarmed with the people, eager to enjoy the fun and excitement, and certainly the display was very extraordinary. There were all sorts of vehicles and ridiculous costumes, moving in procession through the principal streets, the scene being enlivened by bands of music and the promiscuous discharge of confetti upon the crowd of pedestrians, many of whom resembled the old limekiln man, who some years since was a character upon the streets of New York. I cannot undertake to describe all the strange looking vehicles that were rigged up for the occasion, but I remember one that resembled an immense lobster, drawn by six horses, with outriders in livery, the space in the vehicle being occupied by men in priestly robes, and with large hats made to resemble crows' heads, that kept up a continual "cawing" at the crowd. Another vehicle was a dilapidated old mill, with the word "Rome" painted upon it in large letters. Another was designed to represent a blacksmith's forge, with men employed in forging out implements of war, and receiving at the same time the benediction of a priest, which I understood was intened to burlesque the Pontifical government, which combines both war and religion. A procession of sixteen war chariots, made of half barrels mounted upon two wheels, in each of which chariots stood gladiators, drawn by mules having cardinal's hats tied on between their long ears, and led by colored grooms in fancy costumes, the whole designed to caricature somebody, was also a very noticeable feature. Two days were devoted to this more amusing feature of the occasion, and one day was given up to a display of the finer turnouts, into which the Prince Humbert and all classes of citizens mingled with freedom.

The most interesting single object in Milan is the wonderful Duomo, or Cathedral. From a little descriptive guide book which has been published for the convenience of visitors, it appears that the foundations of this edifice were laid in 1386, by one of the dukes of Milan, who made a vow of some kind, the nature of which is carefully concealed from the reader, but it is conjectured that he wanted in some way to wipe out an awful crime, and knew not how else to do it. It is built entirely of white marble, and since commenced it has occupied the skill and attention of nearly two hundred different architects and engineers, among whom I notice the names of Leonardo da Vinci and Giulio Romano, who were celebrated painters. It is difficult for the mind to conceive of such folly and prodigality of expenditure, but the author of the guide before me states that 550,000,000 of francs have now been expended upon its construction, and from present appearances it will require many years yet to finish it. The Cathedral is intended to be Gothic, although it is not purely so. The exterior has thirty-two fine pilasters, richly decorated by a great variety of statues and figures; the roof is a wilderness of spires, pinnacles, and points, into the recesses of which there are also many marble statues, frequently the work of the best masters of Italy. Four intelligent guides are regularly employed to conduct visitors to the roof, and glasses are brought into requisition to enable the eye to appreciate some of the master pieces of Canova, which are placed in niches in the spires. The guide informed me that there were more than seven thousand different marble figures on and within the Cathedral. Nobody is expected to have patience to read a long description of this Cathedral, therefore I will conclude what I wish to say about it by referring to one of the many interesting things to be seen inside. I refer to the gorgeous tomb of St. Charles Borromeo, who was once Archbishop of Milan. St. Charles belonged to one of the richest families in Italy, and during the time of his archbishopric he not only devoted his wealth to the good of the church, but during the time of the plague he exhibited a degree of heroism and self sacrifice which has endeared his memory to all the generations which have succeeded. The tomb adjoins the great subterranean chapel called the "Scurolo," and receives a very "dim religious light" through a glazed opening in the pavement of the church, enclosed by a fine bronze railway, upon the top of which a row of lamps are kept constantly burning. Before entering the chapel a fee is exacted from all visitors, and upon payment being made, a priest with lighted candles proceeds to conduct the way downward, through an elegant portal, supported upon beautiful columns, which leads to the gorgeous sepulchre, the ceilings of which are ornamented by eight massive bas-reliefs in silver, and other rich devices intended to illustrate the virtues and more remarkable events in the life of St. Charles. Above the altar stands an elegant bronze sarcophagus, with elaborate silver ornaments, all of the most exquisite workmanship. After the visitor has had time to admire the rich decorations, the priest, by means of delicate mechanism, begins to unfold the sarcophagus, which reveals an elegant casket made of plates of rock crystal, bound together by heavy silver mouldings, the gift of Philip IV. of Spain. Within this casket lies the emaciated body of the saint, dressed in the gorgeous robes, jewels, and insignia of his priestly office. Suspended to the lid is a magnificent cross of emeralds and diamonds, the gift of the Empress Maria Theresa, of Austria. For nearly three hundred years a daily mass has been performed in this chapel tomb, and thousands of people have wept and prayed with grateful hearts for the continued intercession of the saint.

A pleasant carriage drive of fourteen miles from Milan, leads to the Certosa, the most splendid monastery in Europe, founded by Visconti, Duke of Milan, to expiate for the murder of his father-in-law. The front of the church is one mass of bas-reliefs in marble, while the interior is the richest in Italy. The altars and chapel are composed of mosaics and precious stones of lapis lazuli, rubies, agate, porphery, jasper, and the rarest oriental marbles and alabaster. The pictures and frescos are by the first masters of the period. I never before beheld such liberal adornment and wasteful extravagance, and all for the purpose of washing a guilty soul of the crime of murder, which no earthly law could reach and punish. Such was the exemption accorded to the wealthy and powerful criminal of those ruder times. The monastery and cloisters adjoining the church are extensive and elegant, and the only occupants are twenty-four Carthusian monks, who never pass beyond the limits of their seclusion. They have each a small dwelling opening upon the grand cloister, with two small rooms and a little garden in the rear. They have little or no intercourse with each other, and their food is handed to them through a small trap door, let into the wall facing the court. They occupy themselves in reading their breviaries, saying prayers, and attending to their other religious duties. In other words, they keep fat on poor living, and consider it their religious duty to crucify the body for the good of their souls. They subsist upon the scanty revenues of some small endowments, and employ a little of their leisure from religious duties in cultivating vegetables and flowers. The Certosa furnishes a magnificent retreat for those who, tired of the follies and vanities of the world, prefer laziness and seclusion to the industry and active outdoor life among men.

At this point I propose to lay down the pen of a wandering scribe, and to quit the field, having nearly completed the somewhat extended tour which I originally marked out.

S. H. W.

Making White Lead.—A few weeks ago we made a note of the fact that a new process for producing an excellent article of white lead, had been devised by M. A. Giffard; the following is the plan referred to: Granulated metallic lead is placed in a barrel, with one fourth its weight of water. By a suitable arrangement the barrel and contents are rotated about forty turns per minute, while a continuous current of air is forced through at the same time. After revolving for about two hours almost all the lead will be oxidized, and now a current of carbonic acid is substituted for the air, and the rotation continued for five hours longer, when the true white lead, which constitutes almost the entire contents of the barrel, can be separated by decantation, washed and dried.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Steel and Iron Rails.

MESSRS. EDITORS:—The following remarks, though containing nothing absolutely novel, may be of interest to some of your readers:—

Locomotive and car wheels slide more frequently on steel rails than on iron ones, on account of the smoother surface of the former, but this loss of adhesion, and consequent loss of speed, is in reality so small, that it is more than compensated by the advantages gained, viz:

1. The grinding action, which, on iron rails, is greater than required for adhesion, is dispensed with, and the wear of rails and tires alike is reduced.

2d. In curves, the outer wheel must traverse a greater distance than the inner wheel, the outer wheel therefore must slide part of the distance; both wheels making the same number of revolutions. The smooth steel face offers no resistance to this necessary performance, but the uneven and often laminated surface of the iron rails causes so much friction that the axles are subjected to a very dangerous torsion or strain. It is a fact that breakage of axles generally happens while passing a curve.

In adopting the use of steel rails many engineers have retained the old-fashioned, low patterns, used for iron rails, say 3½ inches, or 3¾ inches high, with base of the same, or even greater width than the hight. Without changing the weight a steel rail may be made 4 inches or 4¼ inches high, instead of 3½ inches to 4 inches respectively, because the sectional area of head given to an iron rail, in order to resist compression and exfoliation, is not necessary in a steel rail. The base of a rail should be less than the hight, because the strength against deflection or transverse pressure increases in the ratio of the simple width and the square of the hight.

The slow abrasion of steel rails is proved beyond doubt, and on that account their life may be calculated at twenty years, or more; but their endurance against continual tensile strain may not, and probably will not, be in the same proportion. It is, therefore, of the utmost importance to give a hight of profile which will obviate, or, at least, diminish this strain.

The advocates of broad bases and low profiles maintain that the former is necessary to prevent the rails from falling over! and that the latter are sufficient for close bearings—says 2640 cross ties to the mile, 2 feet from center to center. This is erroneous. On railroads on the European Continent, rails 5¼ inches high, and with 3¾ inches base, are laid on pine wood cross ties, which do not hold a single spike tight after two years' use; nevertheless, the rails do not fall over. The number of cross ties is not so important as the substantial manner in which they are laid, viz: firmly, and on a perfect level.

It is no uncommon occurrence that, when the spikes hold tight, some cross ties hang actually suspended from the rail, instead of supporting it. Cross ties sometimes will settle below the common level. The consequence is, that if one cross tie settles, and the bearings next to it remain firm, the actual distance of bearings is doubled. Would any of the low rails be strong enough to resist the increased transverse pressure?

Some manufacturers, who were over anxious to promulgate the economical advantages of steel rails, favored the almost general illusion that steel rails could be made much lighter than iron rails. This is correct in theory, but not applicable on railroads on which rails of less weight than 60 lbs. per yard are considered sufficiently strong for heavy traffic.

Recently, a contrivance has been adopted on several railroads for fastening the rail ends to the cross ties without punching spike-holes.

The base of rails on most American railroads is sufficiently wide to allow of punching it on both sides without endangering the stability of the rails.

Any steel rail, no matter of what make, which is less safe in that respect than an iron rail, and consequently lacks toughness, should not be used at all. The interests of the public demand that the innovation of steel rails shall not only benefit the stockholders by a saving of expenses in maintenance of roadbed and rolling stock, but that it shall also put a stop to the frequent disastrous accidents from broken rails. Railroad managers are apt to disregard this so long as the percentage of broken steel rails is not alarming from an economical point of view, whereas it could be entirely avoided. I also doubt, that any contrivance will secure rails so completely against longitudinal motion, as the firm hold which the notches or holes punched in the rails give to the spikes.

A. E.

New York city.

A Literary Bureau Wanted.

MESSRS. EDITORS:—There is a want in the literary world similar to that which your journal or your house supplies in the scientific world. An inventor knows to whom he can apply to have the product of his brain brought into notice. He will put himself in the hands of MUNN & Co., and feel sure that they will use every exertion to put his invention before the public. Without such an agency as yours, it is certain that many an ingenious invention would never have seen the light.

Now I wish to see an agency established in New York which will do for the world of writers what you are doing for the world of inventors. There is plenty of mind running to waste in our country, not for want of self employment, but for want of knowing how to put in form and have published the written products of that mind. Take a case in point. A thoughtful student writes out the result of much reading and thinking in a book; he puts his mind into a volume. If published, it will be read; it will instruct, or what is better than mere instruction, it will stimulate mind and excite thought. He endeavors to have it put in print, but from poverty cannot afford it; from want of friends and influence with publishers he cannot have it brought out. He fails in his effort to reach the public, and the world is not bettered or benefited by his thought.

Let an agency be established to which manuscript can be sent, and to which authors can apply; let this agency communicate with publishers, bring new works to their notice, contract with them in regard to publication, and in every way aid the author as you now aid the inventor. Such a plan, well carried out, will not only help the writing public, it will also tend to make New York the emporium of literature in this country.

JOHN FENTONHILL.

Richmond, Va.

[We apprehend that the position of examiner for such an agency would not be very eagerly sought; the examination and frequent rejection of manuscript is one of the most unpleasant duties of the editor, and those persons not in a position to know, can hardly realize the quantity of matter submitted to our literary, magazine, newspaper, and book publishers. Some of our large publishing houses employ persons who devote their whole time to reading manuscript thus submitted, a much larger proportion of which is rejected for lack of merit than ever finds its way into print.—EDS.

Insecurity of Buildings---Protection from Fire.

MESSRS. EDITORS:—I was much interested in your remarks in a recent number about the construction of flues in stores and other buildings, particularly where steam boilers are used. It suggested some reflections which I will endeavor to express. Every engineer knows the fact expressed in your article and can confirm it and add scores of others to the list if it would do any good. This is, however unfortunate it may be, that every one who has owned a steam engine for a few months thinks himself an engineer and adopts the principle of every man his own engineer. This is the key to the whole mystery. If they were the only sufferers by their own enginering, the public might not complain; but such is not the case, as their malpractice is productive of great insecurity, causing enhanced rates of insurance and the consequent depreciation of surrounding property. This is entirely unnecessary, provided the boilers are properly set and flues properly constructed. There is no more risk when the proper precautions are taken than there is in boiling a potato pot over a cookstove.

I will mention a case or two that have recently come under my observation. A slight wooden structure for a smith's shop with some half a dozen forges and heating furnaces, with a steam boiler of the capacity of twenty horse-power. The roof was flat, made of inch pine boards and covered with tarred paper. The chimney, or rather smoke pipe of the boiler, passed through the roof and was nicely fitted to the wood and made water tight by the tarred paper; the smoke pipes of the forges and furnaces were fitted with the same care and nicety. The brick setting of the boiler was carefully placed in contact with the wooden wall of the building. This was the general style of the engineering of the whole concern. It went into operation and in less than a year was totally destroyed by fire, loss reported at $30,000 to $40,000, and, fortunately, no insurance.

Another concern is now nearly ready to go into operation. The works are for a wood planing and sawing mill and the manufacture of sashes, blinds, doors, and for wood turning, with a 60-horse engine and boilers to correspond. The structure is of wood, three stories high, something like 100 by 50 feet plan. The two boilers are placed outside of the building on the windward side with nothing to break the wind setting in from the bay. The boilers are set in brick work carried one course of brick above their tops and are suspended at each end by bolts passing through lugs on each side and at each end of the boilers, and secured by passing through timbers running across the brick work, with their whole under surface in contact with the heated bricks of the setting in which the expansion and contraction of the boiler is sure to make cracks and fissures its entire length. The fuel will be shavings, sawdust, waste stuff, etc. On the top of this boiler setting is erected a structure intended for a kiln for seasoning the lumber to be used in the works. This structure is of pine and spruce, placed in direct contact with the heated brickwork of the boilers, in order to utilize the heat that would be otherwise wasted; certainly economical! the underwriters will probably appreciate it!

F. W. B.

Atmospheric Temperature and Snow.

MESSRS. EDITORS:—The explanation you gave of the popular saying, "It is too cold to snow," on page 151, current volume, is not in my opinion the correct one. It is a fact, and you like "facts," that at present it is here two degrees above zero, and it is snowing very hard and very boisterous, and all the snow that has fallen to-day has not prevented a great many frozen ears and noses.

Another fact is, we can make it snow whenever we like if the weather is cold enough, on a small scale to be sure, but really to snow, by simply ejecting a current of moist, warm air into the cold atmosphere; for instance, when the doors of a church are opened after service on a very cold day, the moisture in the warm air is immediately frozen and falls in a small shower. This is no rare phenomena—exactly so in nature. To snow there must be a meeting of heated moist air and cold air. Now suppose we have a duration of cold weather, we know that there is (comparatively) no moisture in the air, because cold air cannot retain moisture, and consequently it cannot snow, and however much lower the temperature may fall, there will be no snow; "it is too cold to snow." We must wait till a warm current comes from another quarter laden with moisture, and as soon as this happens, two effects are produced, first; by the mixture of warm air the temperature rises; second; the warm air is cooled and is no longer able to retain its moisture. If this warm current comes on a low stratum and is warm enough we have a thaw and it rains, if not warm enough to raise the thermometer above 30° it will snow large soft flakes of warm snow, but if this warm current comes to us as is the case here at present when the thermometer has been ranging from 20° below to zero, then it is only able to raise the temperature a very little, but it is compelled to yield up its moisture and we have a storm of those beautiful crystals of hard, crisp snow that is only known in our high latitudes, consequently it is correct to say "it is too cold to snow," when we have a continuation of cold, dry weather, and we will have snow when a current of warm, moist air comes to raise the temperature and yield up its moisture.

F. D.

Montreal, P. Q.

Steam Economy.

MESSRS. EDITORS:—The benefits derived from steam expansion have been the study of the engineering world from the time of Watt, who first laid down the law of expansion. The experiments of Isherwood, Dickerson, and others in regard to the economical use of the expansion of steam has not been satisfactory.

Upon the trial between the *Arethusa*, built by Penn, the *Octavia*, built by Maudslay, both favorite builders for the British Government, and the *Constance*, built by Randolf, Elder & Co., the latter furnished with their compound standing engine—on a voyage of these steamers to Madeira, the *Constance* proved to be the fastest boat and consumed from 25 to 30 per cent less coal, all of the boats being built from the same models.

A recent test of this new engine was made at Buffalo. The consumption of fuel was the only point sought to be arrived at. The propeller upon both tests was made fast to the dock and, with an equal pressure of steam, making the same number of revolutions, a saving of twenty-one and one-half per cent resulted in favor of the combined cylinder engine.

In carrying higher steam, say eighty pounds per square inch, with boilers suitable for the pressure, there would be still better economy.

There is now being altered in this city, changing to the combined cylinder, the engines of the propellers *Nebraska*, *Colorado*, *Idaho*, and *Free State*, which will fairly demonstrate during the coming season to the relative value, and what actual saving there is to be derived from this form of combination.

DAVID BELL.

Buffalo, N. Y.

Aluminum Bronze.

MESSRS. EDITORS:—As a completion to what you have said in your last number of the properties and uses of aluminum bronze, I beg leave to add a few words about the preparation and cost of this important metal.

In order to have a good alloy, the copper used must be quite pure; the best is copper deposited by electricity. Next to this is the copper of Lake Superior, which also gives an excellent alloy. Almost all other coppers fail, because they contain iron, for which aluminum has no affinity. Another thing to be observed is to remelt the alloy two, three, and often four times. The first melting is very brittle, the second is less, and the third generally gives off a good metal. Hammering also improves the strength and tenacity of the metal.

Aluminum bronze would cost nearly five times the price of gun metal. For mathematical and astronomical instruments, this is no doubt the best and comparatively the cheapest metal that could be used.

CHAS DE G.

Seton Hall, South Orange, N. J.

Neutral Acetate of Lead.

MESSRS. EDITORS:—One of your correspondents complains (p. 247) that in order to make neutral acetate of lead he has to take more than 51 parts of acetic acid against 111·7 of oxide lead, which should be the right proportion after the theory of chemical equivalents. Allow me to remark that the compound ($PbO, C_4H_3O_3$) naturally possesses, with a few others, the peculiarity of an alkaline or basic reaction toward the usual tests, and in order to make it behave neutral, an excess of acid above the regular atomic relations has to be added.

P. H. VANDER WEYDE, M. D.

How is a Ball Kept in a Fountain Jet.

MESSRS. EDITORS:—In regard to the force which retains a light ball in the jet of an upward-spouting fountain, I am inclined to believe that its position is assured by the pressure of the atmosphere. A cannon ball flying rapidly through the air induces an inward tending current of atmospheric air, caused simply by the momentary vacuum made by the rapid flight of the ball. This inward flowing current has, of course, a tendency to suck or draw in any light, small body and induce it to pursue the line of flight of the ball. A stream of water moving rapidly upward through a tube seems to have a similar effect. If the tube be removed would not the atmospheric pressure still be less inside the stream than outside, and would not any small body, not too heavy, be drawn within the influence of the stream; that is the influence of the in-drawing current of atmospheric air?

West Pittsfield, Mass.

P.

[We think the theory of our correspondent has considerable plausibility.—EDS.

Parasites on Insects, and other Animals.

Messrs. Editors:—For the information of your correspondent who mentions, p. 259, his observations about the house-fly parasite, we observe that this parasite is well known and described in books on that subject, is even quite common in some localities, and has nothing to do with the transmission of contagious diseases. As far as our present knowledge on the last subject extends, it appears that the organic structures which undoubtedly propagate contagion belong to a much lower stage of organization than parasites; one so small as to be only visible with the strongest magnifying powers, and their germs, seeds or eggs escape our most careful research altogether, as they appear to be present in the very dust of the air we breathe. The only fact known in relation to flies and cholera morbus, is that it has been observed in many localities that at the time this disease was raging, the usual number of flies was either entirely absent or at least considerably diminished, which is an additional proof that flies are scavengers of the atmosphere.

In regard to insect parasites in general, the species which infect the fly is called *acarus*. The smallest acarus is found on the clothes-moth, the largest on the beetle. They are all very similar to the so called chicken-louse, and also resemble slightly the cheese mite. They are usually blind, have two or four suckers or points at their heads, and, like spiders, eight legs which are commonly arranged two and two, close together. The ticks, lice, flees, bed bugs, etc., have to the contrary eyes and only six legs, and belong to a different and higher order.

The most curious of these parasites is the one which selects the respiratory orifice of the common garden snail; it slips through the opening the moment the snail dilates it to respire air, and lays eggs in the interior membrane, where they are developed. The young, after being hatched, feed upon a portion of the snail's body. The water snail is tormented with a parasite of the family of the *Distoma*, which attaches itself by a series of hooks to any part of the body or mantle. They sometimes surround the whole animal like tufts of thread.

Diverse reptiles, like serpents, and even fishes are affected by parasites, who attach themselves to the fins or tail, and slowly destroy these parts of the suffering animal. They are often observed among fish captive in an aquarium, and I once found on such a parasite who had grown large and fat in destroying a small fish in one of the aquariums I used to have in operation, in the Cooper Union in this city, a second parasite who lived on the first. These parasites of parasites are a great curiosity, however not so very uncommon, they are repeatedly observed by industrious investigators.

In a hygienic point of view the study of this subject is most important, and at the present day undergoes a thorough investigation by observers, aided by the most powerful microscopes. To give the reader an idea of this field of research, I will only name some of the varieties of parasites found on different animals.

Docophorus ictervides, found on every species of ducks; *Neimus obscurus*, found on sand pipers, godwits, etc.; *Neimus rufus*, found on hawks, falcons; *Docophorus lari*, found on gull tribe; *Trichodeites scalaris*, found on oxen, asses; *Tediculus capitis*, found on head of man; *Tediculus vertimenti*, found on clothes of man; *Tediculus tabescentium*, found on bodies of men dying of marasmus; *Tediculus inguinalis*, found on groins, armpits, beards of man; *Acarus scabiei*, the itch insect; *Sarcoptes scabiei*, produce the scab in sheep, and has lately been discovered to be the cause of the mange in dogs. In one pint full from a dog suffering from this disease, as many as thirty or forty of these parasites were found.

I could fill with such lists several columns of this paper, to show how thoroughly the subject is being investigated. I will only add that of all these parasites, and several hundreds more, their habits have been described, their mode of propagation, number of eggs, time and manner of hatching, means of their extermination, etc. They infest most of our articles of food, flour, cheese, sugar, dried figs, and other saccharine fruit, others live on contents of our insect collections, butterflies, etc.; others in the crusts of ulcers, etc.

I refer those who wish to know more on the subject to Rheidi's work "*Treatise de Gene ratione Insectorum*," and Denni's "*Monographia Anapluroprum Britannia*," Bohn, London.

V.

New York City.

Polygons.

Messrs. Editors:—One of your correspondents wants to know (see page 247) the extreme radius of a 52-sided polygon, the radii of which are 12 feet. When we take into consideration that each side of such a polygon is the chord of an arc, of one 52d part of 360° or the double sine of half that arc that is the double sine of 3° 27′ 40″, we find for the radius 1 this side, according to the tables, equal to 0·120760, and therefore when the side is 12 feet, the radius will be 12 divided by 0·120760, that is 99 feet 4½ inches very near, or within less than 8 inches equal to 100 feet. As 12·5 is the eighth part of 100 we see that this teaches at the same time that the eighth part of the radius is only a little larger than the polygon of 52 sides, and may be used for it in case that an error of one 250th part of the radius may be neglected.

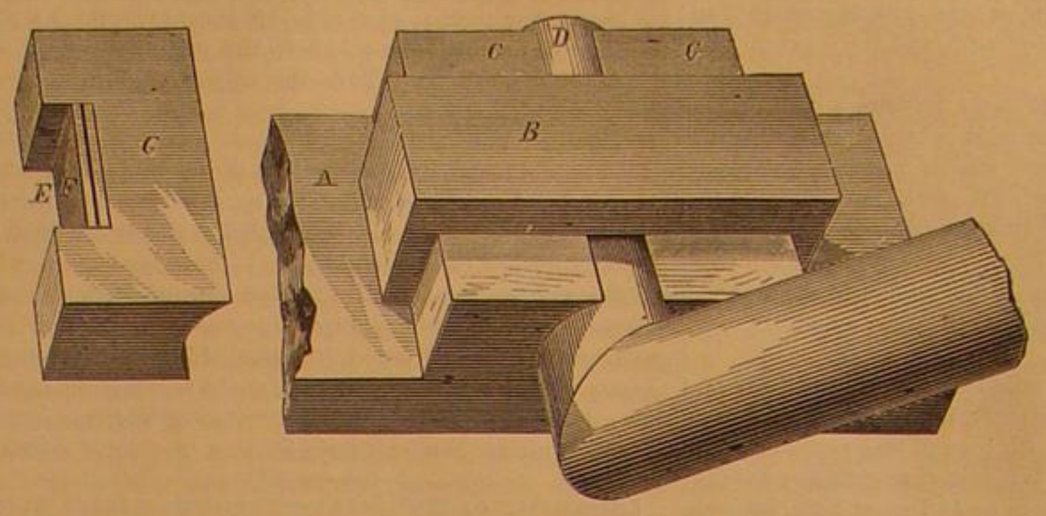
V.

The New York Lyceum of Natural History.—This society will celebrate its fiftieth anniversary, at the Cooper Institute, on Wednesday evening, April 29th. Addresses are expected from Dr. Barnard, President of Columbia College, Dr. John Torrey, Rev. Dr. Thompson, and other gentlemen eminent for their scientific attainments.

Improved Attachment to Mowing and Reaping Machines.

The rattling noise of the working parts of mowing and reaping machines is annoying and liable to frighten horses which have not become used to it. But the wear of the wrist pin, and its boxes, connected with the cutter bar, is a more common evil. There is a great strain on these parts, and it is sometimes difficult to keep them in working order. The device shown in the accompanying engraving is designed to make the pitman connection as enduring as the rest of the machine, and to prevent unnecessary noise in working.

A is a section of a cutter bar, having a frame, B, attached, in which are halved boxes, C, for the reception of the wrist,



KINTNER'S PATENT BOX FOR HARVESTER PITMANS.

D, of the pitman. The rear part of the boxes have vertical grooves, E, embracing the uprights of the square frame, B, and having a suitable packing, F, of rubber, or some elastic substance, so that when the wristpin is inserted between the boxes it is held firmly, but without binding. Thus any sudden jerk of the material being mowed or reaped against the outer end, or any portion of the cutter bar, is relieved by the elastic packing, and there is less wear on the wristpin, always a weak part.

The patent was issued to Jacob L. Kintner, Rock Haven, Mead county, Ky., who will give any additional information as to rights, etc., if addressed as above.

Patent Telescopic Speaking Trumpet.

Frederick J. Miller, of Brooklyn, N. Y., has invented and constructed a handy speaking trumpet, which is made in sections sliding one within the other, and the whole when closed being contained within the bell, as seen in the smaller figure. When in this position the sections are held together by a simple catch on the mouthpiece engaging with a circumferential wire around the bell. The trumpet may be extended for use, as in the larger figure, instantly, when it is in all respects equal to one made in the usual way. A trumpet made in this style can be easily carried in the pocket, and is always ready for use and never in the way when not wanted. For firemen, sea captains, and others, it will be found to be exceedingly convenient.

Martin's Patent Safety Swing.

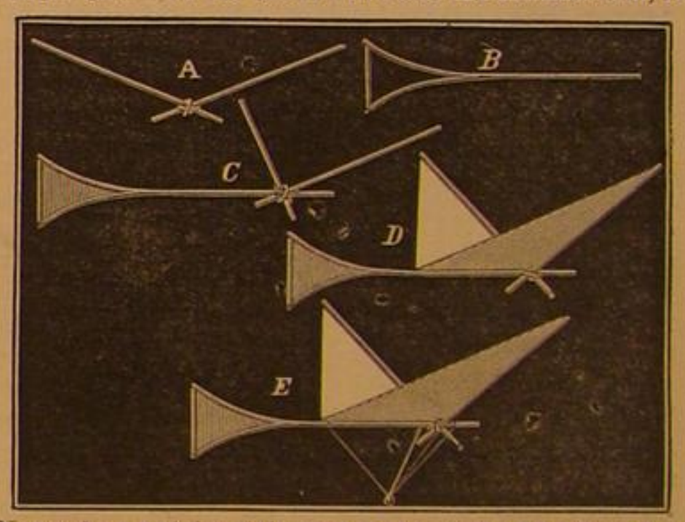
The engraving shows a swing intended for the amusement of children and as a substitute for the cradle. It is a car attached by two parallel pivoted bars on each side to the top pieces of an upright frame. This arrangement gives an easy

motion to the car and preserves it in a horizontal position in every part of its course, rendering the exercise of swinging one of positive pleasure without the danger of vertigo or any other uncomfortable sensation. The sides of the car are sufficiently high to prevent the danger of falling out, and it can be made to seat two or more children or adults. As the suspension bars are rigid, the sickening sensation from the swaying motion which is inseparable from a rope swing is avoided. Used as a cradle the child is not tossed about, but is kept in a quiet condition. When the swing is set in motion it retains its momentum for some time, avoiding the constant labor attendant in the use of the cradle.

Patented through the Scientific American Patent Agency, March 31, 1868. Address Samuel E. Martin or Samuel Swank, Shamokin, Pa.

A Flying Parachute.

There are many instances in veritable history where a scientific toy has developed into a valuable aid to mechanical progress. A correspondent from California sends us a communication in which he advances the same idea, illustrated by sketches which we reproduce. He says: "Having followed the sea a number of years, I have noted with much interest, the progress of sea birds through the air, and wondered whether man had not as good a right in the aerial kingdom as birds, who seem to possess it alone. As the subject of aerial traveling seems to have aroused some attention in Europe I have made bold to give my idea of a contrivance for supporting a weight in the atmosphere. Try this experiment; get three small sticks half the size of a penholder and about eighteen inches long; take two of them and tie them crosswise, as at A, then a third one, splitting it at one end and inserting between the open ends, a short stick, as at B. Then tie the whole or unsplitted end to the two crossed pieces, C, to form a frame for the wings and tail. The body and tail with pieces of paper pasted on the sticks will make the artificial bird, D.

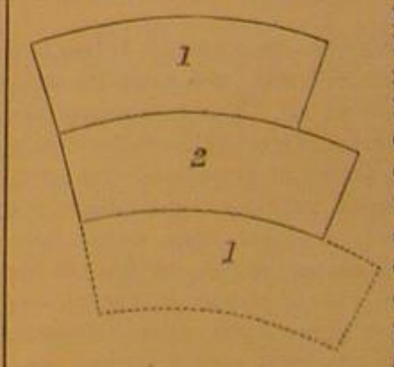


Now take a weight of three or four ounces and suspend it, as shown at E, and your flyer is complete. Two of the strings should be attached to the wings, each about six inches from the intersection of the wing sticks with the body or straight stick; the other two to be attached to the straight or horizontal stick. Try the apparatus in a room until you have the right relation between the weight and the bird; then send it out of an upper window."

[We have not tested this toy, but offer this description for the benefit of our young readers. Perhaps it may be of more consequence than a mere amusement in leisure hours.—Eds.

Another Optical Illusion.

We give, for the amusement of our readers, a little diagram to show how easily the eye may be deceived as to absolute size by a comparison of similar objects. The segments of circles in the diagram are really of one and the same size; but, arranged as they are in the engraving, they do not appear so; certainly, the lower 1 looks longer than 2, and much longer than the upper 1. This may be proved by drawing two concentric circles on paper and dividing them by equal spaced radii, so that each segment shall be of the same size, and then, cutting the segments out and placing them as in the diagram, they will appear to be of unequal size, but placed one on the top of the other, they show equally on every edge. Wheelwrights understand this, as by placing fellies—the segments of the wheel rim—in different relative positions, this illusion is perfect, and also its solution. The whole difficulty, which prevents us from judging properly of the relative sizes of the segments, lies in their arrangement. In the diagram, one side, forming one of the radii of the circle, is in line, each of the segment ends being accurately joined; the others present their longer sweep to the shorter circle of the next, and this confuses the eye, which is insensibly attracted to these divergent ends.



Bleaching Cotton Seed Oil.—W. R. Fee, of Cincinnati, Ohio, sends us the following recipe: Use one gallon of English caustic soda, in a solution of about forty degrees of strength, to about twenty gallons of crude oil. The oil, previous to being mixed with the solution, must be heated to about 90°. Stir constantly while adding the cold solution. If the oil is not now sufficiently light, add more of the solution to bring it to a light yellow or straw color.

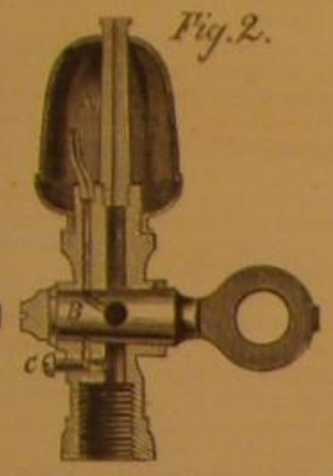
LOCKE'S SELF-LIGHTING GAS BURNER.

Matches are a great convenience, but their use is more or less troublesome and dangerous. Many, when they have used a match, throw it, while lighted, on the floor or anywhere, by which carelessness, undoubtedly, many fires are caused. In lighting gas jets, a match must be used on every occasion, or a taper must be employed, entailing danger in one case, and trouble and cost in the other. The lighting of gas by electricity is convenient only in halls or other large rooms where it is desirable to light many burners at the same time. All these annoyances are avoided by the simple device shown in the accompanying engraving.

Fig. 1 is a perspective view, and Fig. 2 a vertical central section. The burner can be attached to any gas pipe in place of the nipple generally used. Its peculiarity consists in having a supplementary miniature pipe, A, Fig. 2, by the side of the main nipple. This receives its supply of gas from a channel, seen at B, cut from the main supply aperture in the cock spirally and partially around its circumference. A screw, C, passes through the side of the burner under the cock and serves to regulate the amount of gas admitted to the channel, thus regulating the flow of gas according to the pressure.

Fig. 1

Fig. 2.



When the gas is turned on to the main burner, the supply to the secondary burner is entirely cut off; but when shut off from the primary or principal burner, a small portion escapes through the auxiliary, being lighted in the instant of turning off by the flame from the main burner, in consequence of the rapid spiral of the channel cut in the circumference of the cock, which is simply a "fast" screw thread. In lighting, the jet of gas from the auxiliary tube, when the cock is turned, "jumps up" and ignites the gas from the main tube. The small tube, of course, burns gas when the main tube is not acting, but the amount thus burned is slight and proves to be far less expensive than the use of matches and other appliances for lighting gas. A cowl or cap, as seen in the engraving, protects the small jet from being extinguished by currents of air.

Patented April 7, 1868, by Richard B. Locke. Communications should be addressed to R. B. Locke, Secretary of the Self-Lighting Gas-Burner Company, at 451 Broadway, New York city.

PICTORIAL PRINTING.

In the new volume of the *Annual of Scientific Discovery* reference is made to, and an illustration is given, of an invention brought out during last year, designed for producing pictorial effects by the use of movable metal types, cast like ordinary printing types and bearing upon their faces different devices, which, by their combination, produce the desired effect. A full-page illustration, printed on landscape type, and representing the home of the Adams' at Quincy, Mass., is given as evidence of what is possible to be accomplished by this invention. The type used are each one thirty-second inch square, their surfaces either plain, blank, or lined in various directions and degrees of fineness. The two edifices, with doors, windows, chimneys, columns, and roofs, are represented in the cut before us in accurate prospective, and even the trees, foliage, clouds, and other accessories of the landscape are portrayed with a considerable degree of fidelity. The general picture presents the familiar appearance of the patterns for canvas needlework; every straight line appears as such, but the curved outlines approximate to that form by rectangular gradations.

This plan is a Boston invention, and is not yet even fully developed; but even when perfected, it is doubtful if pictures thus printed will ever equal in beauty those produced by a process, similar in principle, to the foregoing, and, like that, first made public during the past year. The latter invention is due to one Fasol, a printer in Vienna, and the art, as practiced by him, is called "Stigmatypy," from the fact that he uses only the full point, of different sizes, cast upon the same body. The variations in shade, and the whole effect is produced, as in ordinary stipple engraving, according to the proximity of the points. Both processes are yet in their infancy, and we await with interest their further development.

EFFECT OF FROST ON LARVÆ.—In a paper addressed to the French Academy, M. Reisert announces that the general belief held by farmers, that a severe frost kills noxious insects and larvæ that grub in the earth, is a fallacy, the only effect of the frost being to drive them still deeper into the earth. He found that while the thermometer stood at 5° Fah., and the ground was covered with snow, the soil at a depth of twenty inches was not influenced by frost, and below this line the larvæ were to be found; descending still further as the cold increases.

THE CONSTRUCTION OF WATCHES.

BY H. F. PIAGET.

No. 2.

A clock has a combination of wheels to mark the number of oscillations made by the pendulum. A watch is a similar combination to mark the number of vibrations made by a balance. The wheels of a clock may be impelled by a weight, and the time measured by a pendulum; but as the watch must go in all positions, neither the weight nor the pendulum can be applied to it.

The power of motion in a watch is produced by means of a spiral spring, usually called the main spring, placed in adrum or barrel, which when wound round a center will from its elasticity cause the barrel to make as many revolutions as there are turns made by the spring. Time is measured in a watch by the vibrations of a balance, which if moving in equal space, will make all the vibrations in equal time.

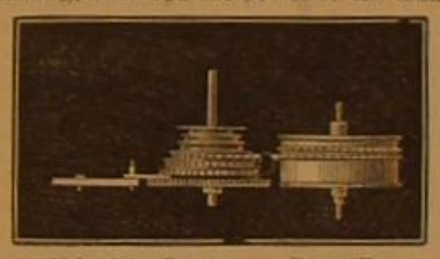
Main Spring.

The escapement is the name given to that part of the watch which transmits the power from the wheels to keep up the vibrations of the balance; the escapement also prevents acceleration of the wheels, by holding them in check until the balance has completed its vibration. If the force exerted by the unfolding of the spring be equally transferred through the wheels to the escapement, and if the impulse given by the escapement to keep up the vibration of the balance be equal, then will the motion of the balance be also regular, and the watch will measure equal time. But the force of the spring is unequal—it is strongest when fully wound, and becomes weaker as it uncoils. To compensate this inequality, a cone is employed with a spiral groove, called a fuzee, to which is attached the first wheel.

The wheels of a watch are thus called:—The wheel on the fuzee is the first wheel; the center wheel, the pinion of which carries the minute hand; the second, or center, the one which in ordinary watches carries the second hand; the fourth, and the next, the escape wheel. In the old rack-lever watches there is one wheel less, the second hand being carried on the pinion of the escape wheel; the second hand then went around very fast, but these kind of watches are nearly out of use, many of them having been altered to the present lever escapement.

The going fuzee, invented by Harrison, to make a watch continue to go while being wound up, and used in all good English watches, has an auxiliary spring, through which the force of the main spring is carried to the wheels. While the watch is being wound, a ratchet and click prevent the reaction of the auxiliary spring, which therefore continues to act during the time of winding, although the power of the main

Auxiliary Spring.



Maintaining Power, Clock and Spring. Barrel, Fuzee, and Chain.

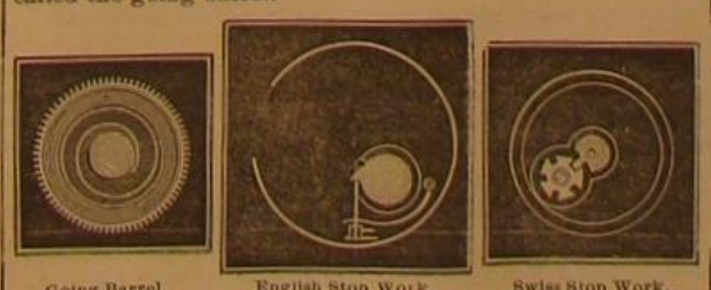
spring is then taken off. The fuzee is connected with the barrel containing the spring, by a chain with hooks at each end. In winding the watch the chain is wound off the barrel and around the fuzee. When the watch is fully wound, the spring is at its greatest power, but the chain being then around the smallest part of the cone of the fuzee, the influence of the spring is the smallest.

As the watch goes down the power of the spring relaxes, but as the cone enlarges its influence increases, and when the spring is down, the chain is upon the base of the cone, where the influence of the spring is the greatest. Upon the shape of the cone of the fuzee, therefore, depends the quality of the maintaining power. There is usually about half a turn of the weakest part of the spring left without action to enable it to draw all the chain to the end, otherwise the watch would not run quite down; that is regulated by a click and ratchet upon the barrel arbor.

Ratchet and Click.

In some watches the ratchet and click are placed under the dial, and cannot be seen by the wearer; in others they are placed on the bar that holds the barrel, and are easily seen on opening the watch.

The fuzee, or cone, can not be introduced into very flat watches. The barrel, therefore, instead of the fuzee, is attached to the first wheel, by the barrel having teeth cut at the sides, and is called the going barrel.



Going Barrel. English Stop Work. Swiss Stop Work.

Stop works are necessary to every watch, particularly to those with chains, as to those without the chain would be almost sure to break, particularly in thick English watches. In Swiss watches, and in all with going barrels, or without a chain, they are indispensable (to a good watch), as by them the spring is regulated as near as possible in its action; not to be too strong when fully wound, nor too weak when nearly run down. A watch without stop works, or one with imperfect ones, will be in danger of having the spring or some of the teeth of the barrel broken in winding.

If the spring is wound up too tight it is much more liable to break, and when broken, if there are no stop works, the strain of the key comes on the teeth of the barrel, and if forced will frequently bend or break them. If the spring to a going barrel be well made, and the wheels so constructed that only the middle turns of the spring are required to be in action, and not those turns of the spring in which it is at its greatest or least power, the force may be sufficiently equal for ordinary purposes; but where the fuzee can be applied it is preferable and certainly the best.

The power of the spring is conveyed to the escapement through the wheels, and the arrangement is nearly the same in all watches; therefore their comparative value in this part of the construction depends entirely upon the skill of the workman and the quality of the materials. The power of the spring being equal, and the wheels and pinions properly constructed and placed correctly to act with each other, which is called "pitching the depths" (this is a term used in wheel work, and it is necessary that the wheels and pinions be placed at proper distances from each other, or there is friction, cutting, and noise in the action, which should not be in a good watch), to convey the power to the escapement, and to keep up the vibration of the balance, constitutes the essential difference between one watch and another.

A watch is described by the form of its escapements.

Several escapements, such as the verge, the vergule, the rack lever, etc., had to be abandoned. My uncle, who was one of the most ingenious workmen in Switzerland and London, and maker of musical watches and repeaters of every kind, and with whom I worked fifteen years, spent upward of five years in inventing and trying new escapements, but had to abandon the idea of making anything better. It was his opinion, and is also mine, from experience, that it will not be possible to get escapements with less friction, and that will maintain their accuracy better than the chronometer, duplex, or even lever, if properly made. Still I may be mistaken, as many things have been achieved within a quarter of a century which would then have been thought fabulous.

Balance of Axis.

The balance of a watch is a wheel nicely poised upon its axis, having its greatest weight at its periphery.

A balance properly placed, with its pivots in their holes, but resting on the points or ends, would, when put in motion, revolve on its axis; but if a spring so constructed as to bend in either direction in which the balance will turn, was to have one of its ends fastened to a point independent of the balance, while the other end was attached near to its axis, an impulse then given to the balance would only cause it to move as far as the force given was able to overcome the resistance of the spring, when the resistance becomes equal to the impulse given; the balance stops for an instant, and then is driven back by the elasticity of the spring to a distance nearly double to that through which it passed in its first motion, and thus continues to vibrate until the friction and the resistence of the air bring it to rest.

Balance and Hair Spring.

A spring thus applied is called the balance or hair spring. This spring has been frequently noticed as illustrating the great value a small piece of steel may acquire from manual labor; it is perhaps more remarkable for its extreme delicacy, four thousand of them weighing scarcely more than an ounce, while the cost frequently exceeds four thousand dollars when used for fine work.

When the balance is at rest the spring is inclined neither way, this position is called the point of rest; and the motion of the balance when influenced by the hair spring, is called vibration.

The application of the balance or hair spring is the greatest improvement ever made in a watch; since it rendered a comparatively useless machine capable of going with accuracy; and now that the principle can be more easily applied, although perhaps not better understood, it offers the means of measuring time equal to a pendulum.

The first watches were made without any balance spring, but with a vertical wheel which moved the wheel backward and forward; and instead of the chain now used, there was only a piece of cord, like a very fine violin string, to convey the motive power of the main spring to the wheels. This balance spring can produce astonishingly varied effects, from difference in the length and tapering, the principle being, the stronger and shorter the spring, the quicker will be the vibrations.

Marine Chronometer Balance and Spherical Spring.

The hair springs of watches are made flat on account of the small space for them to work in; but where there is room, the isochronal spring is applied. In marine chronometers for the use of ships, they are made in a spherical form; the thickness of the spring being the same the whole of its length instead of tapering, as they are easier of execution and better adapted for the regulation of time.

These remarks will not be thought too detailed if we consider that the correctness of the watch as a measurer of time

is mostly dependent on the correct principle of the escapement and of the hair spring.

The curb, or regulator, is the part used for regulating the watch. The purpose is to shorten or limit the motion of the balance to make the watch go faster, and to lengthen it to make the watch go slower.

When a good watch has been produced, with the main spring acting with equal power from the instant of being fully wound to the termination of its time of going, the wheels and pinions perfect in all their parts, the escapement on a good principle and properly executed, and the balance spring so perfect as to make all its vibrations in equal time, even then the watch will vary in the time. It will show a variation upon every change of temperature, unless it be compensatory.

A watch may be said to be a metallic thermometer, for the slightest change in the temperature affects its going in proportion to the change; heat enlarging the balance and lengthening the hair spring, (independently of the effect produced upon all the other parts,) which will make a watch lose, while contraction from cold will make it gain. An action upon the balance, bringing the weight at its extremity nearer to the center, will cause it to gain, and the same effect will be produced by an action on the hair spring, which will either shorten its length or limit its motion; and both of these means are made use of to make watches keep equal time in different degrees of temperature.

When this effect is produced it is called compensation, and is obtained from the different degrees of expansion in metals, and for this purpose the compensating balance is applied to good watches. The compensation balance has its circumference composed of two metals, brass at the extremity and steel within; and as the rim is cut in two parts will expand or contract with every change of temperature. When heat causes the expansion of the spring and balance, it also cuts on the brass at the extremity, and causes that part of the rim which is cut, to be brought nearer the center, and this motion is so regulated by means of screws or weights, as to compensate for the expansion, and enable the watch to measure equal time under the different degrees of heat and cold.

Compensation Balance.

But compensation balances should not be used unless the other parts of the watch are perfect, otherwise they are not so good as the plain gold or steel round rim balance. I have always found the latter kinds to keep very good time, and where the price is limited, are to be preferred, as a bad compensation balance is but a detriment to an otherwise good watch. The compensation curb is frequently applied to watches. Its use is to limit or extend the motion of the balance spring, by a self moving action caused by a change of temperature. The principle is the same as in a compensation balance, the motion being produced by the inequality of expansion in the two metals, (brass and steel,) of which it is made.

There are many who expect an accuracy incompatible with the nature of the machine; indeed, positive accuracy can never be obtained, until an unchangeable material is discovered, of which the work can be constructed.

One of the best time keepers and finely finished watches that I ever saw, was one made in Geneva, or Locle, which a friend of mine purchased in California, and I had it to clean. It had the plates and bars for the wheels made of nickle, the wheels were made of gold, it had a compensation balance, with isochronal hair spring; in short it was a *chef d'œuvre* (for a Swiss watch,) with an anchor escapement.

It is frequently forgotten that time differs in every spot east or west of the place at which the watch is set. At the present speed on railroads, two hours' traveling may make the traveller's watch show some two or three minutes faster or slower, than the local time of the place at which he arrives. In this case, the difference must be added or subtracted to avoid disappointment when travelling. It has been said "that no man ever made a true circle or a straight line except by chance," and the same may be said of any machine which measures time exactly. These remarks neither lessen the perfection or usefulness of watches. They are among the highest specimens of human ingenuity, and indispensable in the present state of society.

MANUFACTURING MINING, AND RAILROAD ITEMS.

At Denver, Col., a company has been organized to build a train-road into the mountains of South Pass, as a means for bringing into the city lumber and all kinds of building material. The plan of construction is as follows: The ties are designed to be seven feet long, round timber; the rail 8x8 wide, sawed spruce timber, 16½ feet long, let into the ties and securely keyed: track four feet wide; car wheels 18 inches in diameter, 4 inch tread, with square flange. These rails can be turned and used eight times, or can be strapped with iron when desired by the company. Small but powerful locomotives are to furnish the motive power. The estimated cost per mile is $1,788.

English capitalists of a speculative disposition are turning their attention to the oil resources of Northern Italy. This country has been known for ages to be rich in petroleum of peculiar qualities and of a natural transparency. In Barigazzo the oil appears on the surface of small pools of water, and throughout the whole of the hills of the northern sections there are unmistakable geological signs of the existence of petroleum deposits. There are oil wells at Monte Bonello which have produced eleven tuns of oil per day, and this at a depth of less than 160 feet. The Italians seem entirely apathetic about developing the oil resources, but the introduction of English capital and American machinery will make petroleum one of the most profitable of Italian industries.

The boot and shoe business of Detroit last year was very prosperous, the aggregate sales of twenty large manufacturers amounted to nearly $6,000,000. One of the most extensive firms sold $2,000,000 worth of goods.

A special freight train was recently started from Concord, N. H., for Salt Lake City, a distance of 2,000 miles. It consisted of twenty cars loaded with stages for the overland line to California.

According to the *Athenæum*, Mr. Galy Cazalat has invented a process to be employed in casting steel, so that tilting is rendered unnecessary. The mold is made of the greatest possible strength, and is provided in its upper part with a chamber in which a quantity of an inflammable powder is placed. When this powder is ignited an immense pressure is exerted upon the surface of the steel, the molten metal is thereby forced into every minute portion of the casting, expels the gases contained in the steel, and causes the metallic particles to be brought into the most intimate union.

In the foundery of the Port Richmond Iron Works, of Philadelphia, are three cupola furnaces, the largest of which will melt twelve tuns of iron per hour. In the machine shop of the same establishment there is a planing machine capable of planing casting eight feet wide, six feet high, and thirty-two feet long; a lathe that will swing six feet long, and turn a length of thirty-four feet; and a boring mill, believed to be the largest in America or Europe, that will bore a cylinder sixteen feet in diameter and eighteen feet long.

The American Central railway, a projected air line road from New York to Omaha, has, we learn, finally assumed a definite shape, and the enterprise is to be pushed through as fast as money in abundance can do it. The entire air line will be made by a consolidation of the Allentown road to Harrisburgh, the Pennsylvania Central to Pittsburgh, the Fort Wayne and Chicago to Fort Wayne, and the American Central to Omaha. The company was fully organized at Fort Wayne, Indiana, on the 5th inst., and the road will be one of the most important now building in the United States. Its length is to be five hundred and eighty-five miles, and by its directness will shorten the route now traversed between this city and Omaha by one hundred and thirty-six miles. When the Pacific railway is completed this new road will constitute with it a grand trunk line from ocean to ocean.

The New York State Legislature, after a protracted consideration, have passed two bills securing two underground railways for the relief of this city. The first bill provides for the construction within three years of a tunnel railroad from the City Hall to Forty-second street, a distance of a little over three miles. The list of incorporators of this road embraces the names of many of the most responsible capitalists of the city, and the required deposit of $300,000, will serve as a pledge that the enterprise will be carried through. Two additional years are allowed to carry the railway to Harlem river, and provision is made for an elevated line in case the lowness of the surface above Ninety second street renders the construction of a tunnel impossible. The other bill passed was for the Arcade railroad, described and fully illustrated on pages 91 and 93, Vol. XVI., Scientific American.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Wood-planing Machine.—Frank Douglas, Norwich, Conn.—The object of this invention is to provide means for rendering the feed rolls more perfectly self-adjustable to planks, boards, etc., of different thicknesses. In accomplishing this object, the upper rolls are supported in a novel manner, and a new kind of adjustable gear is employed to operate them. A new arrangement is also used for applying adjusting weights to the upper rolls.

Carriage Coupling.—Ira and John S. Vanpelt, Petersburgh, Va.—In this invention the use of coupling bars is dispensed with, and a carriage is made without them, which is simpler in construction, stronger, and works better, than the carriages in which such bars are employed.

Shingle Machine.—Albert Thompson, Ridgeway, Pa.—In this invention the carriages are attached by a new device, by means of which one of them can be detached and stopped for adjusting the bolt without interfering with the action of the other. The heading and pointing is also regulated by a new mechanical arrangement, and a new apparatus is employed for adjusting the speed of the carriages.

Gig Saw.—J. W. Moyer, Cherry Valley, N. Y.—This invention consists in providing the saw frame with two springs, one above and one below the saw, which operate together to give it the necessary tension, and which counteract each others' effect upon the motion of the saw, rendering its working even and uniform, and enabling it to be operated with any degree of speed.

Cartridge Box.—John Elbertson, Kirksvill, Mo.—In this invention, the cartridges are arranged in a circular disk, which is hung at its center upon a spindle in a circular case. The latter is provided with a door at its lower edge, by which its cartridges are taken out. The disk carries the percussion caps, also, which are taken out through a port in the upper side of the case. The disk and case are so constructed and arranged that the cartridges and caps will always present themselves at the proper place to be handled.

Door Stop.—A. G. Stevens, Hillsboro', N. H.—The object of the door stop embraced in the present invention is to obviate any injury to the sides of rooms by the striking of the door against the same when opening wide, and for this purpose this invention is a newly constructed and arranged stop applied to the door, which, by the opening of the door, will be thrown into position to prevent its striking against the side of the room and thus obviate any injury thereto.

Watch.—Charles S. Moseley, Elgin, Ill.—This invention relates to the manner of securing or holding the outer end of the hair or balance spring to the watch movement, and it contists in the construction of a stud carrying hair spring, of an arm or extension piece to the bridge plate for the balance wheel, and of a set screw or screws, whereby the adjustment and attachment of the hair spring can be secured with accuracy and it can be always brought to the same position.

Railroad Switch.—Adolph F. Ballas, Pottstown, Pa.—The many accidents which occur through the switches now in use have led to the invention by me of a switch that in itself will be sufficient to guard against accidents, however careless or neglectful the switchman may be, and by the present invention such a switch is obtained, the principle of the switch consisting in arranging in such a manner as to be self acting through a counter weight suitably applied therero.

Anti-Friction Journal Box.—Patrick S. Devlan, Hudson City, N. J.—This invention has for its object to furnish an improved anti-friction material for journal boxes so that the said anti-friction material or part of the journal box may be conveniently replaced when worn by fresh material.

Corn Planter.—D. A. Kershner, Elliottstown, Ill.—This invention has for its object to furnish an improved corn planter which shall be so constructed, and arranged as to drop the corn, cover it and mark the place in which the corn is planted so that the corn may be conveniently planted in check row

Sausage Meat Chopper.—Charles Welte, Frankford, Pa.—This invention has for its object to furnish an improved machine for cutting or chopping sausage meat which shall be simple in construction, easily operated, and effective in operation.

Harrow.—John Rankin, Taunton, Mass.—This invention has for its object to furnish an improved harrow, simple in construction, easily operated, and effective in operation, and which will do its work better and more thoroughly than the harrows now in general use.

Spool Stand.—Nicholas P. Clarke, Central Falls, R. I.—This invention relates to a combination of a revolving spool stand, needle case, and thread cutter, whereby needles may be threaded directly from the spools on the stand and the thread cut of any desired length.

Steam Valve.—William Wilson, Galesburg, Ill.—This invention relates to a method of constructing the slide valve of steam engines, whereby double openings are given both at steam and exhaust ports.

Beehive.—James Wash, Mt. Stirling, Ill.—This invention relates to improvements in beehives, the object of which is to provide a hive that shall effectually prevent millers, moth and other insects from entering the same, and at the same time provide a hive having good ventilation, and which is easy of access to remove the boxes of honey.

Buckle.—John A. Mashmeyer, Beardstown, Ill.—This invention relates to a buckle designed more especially for harnesses but capable of very general application. The object of the invention is to obtain a buckle which will admit of the parts it connects being readily attached together and detached and also readily taken up and let out, and one which will not abraid or injure the parts connected by it in any way whatever.

Combination Tool.—James Swan, Seymour, Conn.—This invention relates to a combination tool, whereby two tools such, for instance as a screw driver and a gimlet, brad awl, corkscrew, or other similar tools may be combined. The invention is an improvement or a further carrying out of the principle on which the pocket or portable corkscrew is made.

Whiffletree Hook.—Francis W. Beckwith, Westmoreland, N. Y.—This invention consists of the combination of the thimble and spring tongue for obtaining a more safe and convenient hook for whiffletrees.

Pen and Pencil Case.—Wm. Maginn, New York city.—This invention consists in the employment of a cylinder of whalebone between the metal ends of a pencil case, whereby it serves to inclose the metal barrel containing the mechanism for protruding the lead holder; and simulates the appearance of the hard rubber heretofore used.

Concrete Block Press.—J. H. Wirt, Delphi, Ind.—This invention relates to the pressing of concrete blocks for building purposes. It consists of a simple and effective arrangement of levers and toggle joints for actuating the press block together with other devices perfecting the whole.

Fruit Crate.—Truman Mabbett, Vineland, N. J.—The nature of this invention relates to the packing of fruit for transportation and consists of a crate composed of slats with spaces between each slat, the said crate also containing an inner or lining crate together with a spring bottom.

Fence Post.—P. McDuff, Weston, Mo.—This invention relates to an improvement in fences and consists of an upright plank secured to a bottom cross piece and brace and having the horizontal planks composing the fence panels nailed to the upright plank.

Lifting Jack.—G. H. Alger, Ames, N. Y.—This invention is an improvement on the lifting jacks as heretofore made and is designed more particularly for lifting thrashing machines when the rear wheels of the same are to be withdrawn to lower the rear of the machine to the ground for the operation of thrashing.

Rudder Gear.—C. T. Rideout, Boothbay Harbor, Me.—The nature of this invention consists in the employment of a traversing segment having teeth which engage with the teeth of a disk keyed to the rudder head, whereby the tiller can be made shorter and take up less room in its travel across the deck, together with a device for securing the rudder in any desired position.

Scaffold Bracket.—Samuel D. Van Pelt, Anderson, Ind.—The object of this invention is to provide a firm point of attachment on the roofs of buildings for the scaffolds used in shingling or repairing the same. It consists of devices for clawing into the shingles of the roof and supporting the plank or scantling of a scaffold.

Tobacco Smoking Pipe.—Henry R. Robbins, Baltimore, Md.—In this invention the pipe, which is so small that it can readily be carried in the pocket, is provided with an improved apparatus for passing the smoke through water, and for preventing the water from escaping into the stem or the bowl, and is so constructed that it can be readily taken apart for cleansing it.

Tobacco Hand Tying Machine.—David C. Delinger, Russellville, Ohio.—This invention is a simple, cheap, and easily operated machine for tying rolls or hands of tobacco, whereby the operation is greatly facilitated.

Railroad Sill and Chair.—Jasper Snell, Pottsville, Pa.—This invention relates to an improved railroad sill and chair.

Knife for Removing Hides and Skins.—S. J. Patterson, Bridgeport, Conn.—This invention has for its object to furnish an improved knife, designed especially for butchers' use in removing the hides and skins of animals, which shall be so constructed and arranged as to guard against injuring the skins and hides by cutting them during the process of removing them from the animals.

Washing Machine.—Milton F. Wickersham and Elisha Roush, Springfield Ill.—This invention has for its object to furnish an improved washing machine, simple and durable in construction, which will not wear the clothes and which will be easily operated.

Scouring and Cleaning Instrument.—V. A. Hacker, Knoxville, Tenn.—This invention has for its object to furnish an improved instrument for use in cleaning and scouring floors stairs, ceilings, windows, etc., which shall be simple in construction, convenient in use, and effective in operation.

Hoe.—G. H. Owens, Maysville, Ky.—This invention relates to a method of fastening a hoe to the handle, whereby it is made much more useful and durable than hoes made in the ordinary manner, and the invention consists in securing the hoe to the handle by a tapering ferrule.

Ventilator for Hats.—George Deas, New York City.—This invention relates to a device which is applicable to all kinds of hats, and consists in attaching to the inside of the hat elastic and adjustable bands, or rings, formed of vulcanized rubber, or other suitable material.

Tightening Wagon Tires.—S. W. Corbin, Vallonia Springs, N. Y.—This invention relates to a method of setting or tightening the tires of wagon wheels, when they have become loosened by use, or from any other cause.

Ventilator.—W. O. Crawford, North Star, Pa.—This invention consists in confining within a case or cabinet of suitable size, one or more air bellows, which may be operated by clock work, propelled by a spring or by a weight, the said clock work or gearing being placed within the case.

Sickle Driving Apparatus.—George G. Lyman, Independence Iowa.—This invention relates to an improved mechanism for driving the sickles of reaping and mowing machines, and indian corn harvesters.

Fastening for Furnace Doors.—P. E. Shear, Saugerties, N. Y.—This invention relates to a fastening for furnace doors, whereby doors for this purpose may be tightly secured in a closed state and very readily opened. The invention in the present instance is applied to a door fitted in a mouth-plate provided with water passages to admit of a current of water passing through to obviate the rapid burning out of the door and mouth-piece; but the invention is applicable to doors fitted in the ordinary frame or mouth-piece.

Beehive.—A. F. Cobb, Chapel Hill, Mo.—This invention consists in constructing a beehive of metal, and coating the same internally with plaster of Paris and beeswax, whereby the ravages of the moth, so destructive to bees, are fully guarded against, and at the same time a very economical and durable hive obtained, and one which may be kept well ventilated at an even temperature, or warm in winter and cool in summer.

Machinery for Augers and Bits.—James Swan, Seymour, Conn.—This invention relates to a machine for upsetting the lips of curved or gouge-lip augers and bits.

Indexing Books, Ledgers, etc.—James H. Swindell, Camden, N. J.—This inventon relates to a method of indexing books, ledgers, etc., so that with two or three turns any desired page can at once be found. The invention consists in subdividing by means of notches such pages which are found by means of the ordinary notches that indicate the capital letters, or the hundreds or thousands, as the case may be.

Corn Planter.—Aaron Armstrong, Gillespie, Ill.—This invention relates to a corn planter of that class which is mounted on wheels, and on which the driver rides. The invention relates to a new and improved mode of raising the furrow shares out of the ground, and in an improved mechanism for operating the seed distributing device.

Stave Jointer.—Hiram S. Wiley, Madison, Ind.—This invention consists, 1st, In the arrangement of a movable circular saw for jointing staves, which traverses in a downward curve, corresponding with and conforming to the curve in the stave. The guides which conduct the saw forward and backward are true arcs of circles and concentric with the driving pulley over head, so that the belt is always kept tight at any part of the travel of the saw frame along its guides. 2d, In a slight lateral curve given in the said guides, whereby a light uniform curve is left in the edge of the stave, which adapts it more readily to the bilge requisite in a cask or barrel. 3d, The arrangement of the curved guides, toothed racks, and the connections for producing the forward and backward movement of the saw frame and saw.

Exhaust for Millstones.—David Baird, Bloody Run, Pa.—The present invention is an improvement upon the apparatus for which a patent was granted to the same inventor Dec. 2, 1867. The improvement consists in providing means for saving any dust or fine flour which may occasionally be taken up by the exhaust, and for carrying off the condensed steam and moisture.

GATE.—John J. Pellett, Oconomowoc, Wis.—This invention relates to the class of farm gates which are expanded and contracted longitudinally in order to close or open them, by means of the device known as "Jacob's ladder," and consists in inclosing said ladder between the bars of a sliding frame, by which the gate is greatly strengthened and at the same time rendered more beautiful in appearance.

FEATHER RENOVATOR.—James C. Moorehead and Wm. W. Elliott, New Madrid, Mo.—In this invention two boilers are employed, one containing pure water and the otqer containing certain chemicals in solution. The steam from these boilers is carried in separate pipes to the cylinder where the jets are united and discharged among the feathers. The latter are beaten and shaken while under the action of the steam, until thoroughly cleansed.

OYSTER WINDER.—Samuel S. Shaw, Newport N. J.—This invention relates to a device to be used on boats for winding up oyster dredges, and the object is to prevent the reversing of the crank shaft in case the dredge strikes against a rock or some other obstruction.

EGG CUP.—C. D. P. Watters, New York city.—This invention relates to a device the object of which is to facilitate the taking up of boiled eggs from the plate and to hold the same in a convenient position, to allow their being partly peeled and their subsequent removal from the shell.

RAILROAD TICKET HOLDER.—Smith M. Brown and Harvey J. Brown, Holly, Mich.—This invention relates to a device for holding railroad tickets, and consists chiefly of a sheet metal plate, having turned inside and bottom edges, whereby flanges are formed between which and the body of the plate a ticket can conveniently be held.

SAW SET.—Jacob Noepel, Newark, N.J.—This invention consists in the use of a rotary punch, whereby the device can be applied to different sized and shaped saw teeth, and in the construction and arrangement of the jaws and handles, whereby the saw blade is caused to remain stationary on the lower jaw.

BRICK MACHINE.—John H. Smith and Charles H. Florence, Richview, Ill.—This invention has for its object to furnish an improved machine for molding brick, which shall be simple in construction, easily operated, and conveniently moved from one part of the yard to another.

EGG BEATER.—Wm. N. Angus, Morristown, N. J.—This invention relates to an improvement in machines for beating up eggs for various culinary purposes, which machines or beaters are operated by hand.

LAMP BURNER.—John R. Ackerman, Edward B. Campbell, and Niram O. Golden, Dobbs Ferry, N. Y.—This invention consists in the application and arrangement of a double cone or cone and cylinder, which surround the wick tube of the lamp, whereby the flame is supplied with atmospheric air or oxygen in sufficient quantity to produce perfect combustion and prevent smoking, without the use of a chimney.

METALLIC HEATING BASE AND MOLDING.—Chas. E. Finkle, New York city.—This invention relates to the construction and improvement of dwelling houses and public buildings, and to the facilities for heating or warming the same.

WASHING MACHINE.—George Hood and John D. Kelly, Providence, R. I.—This invention relates to a washing machine of that class in which the articles to be washed are manipulated between corrugated rollers, and the invention consists in the general arrangement of the machine, in which below a revolving corrugated drum, a frame carrying a series of horizontal corrugated rollers is arranged, the frame being held up against the drum by means of springs.

BOTTLE STOPPER.—S. and S. Cary, New York city.—This invention relates to a new mode of strengthening and protecting cork bottle stoppers, and consists in the use of a cap made of metal foil fitted around and over the upper part of the cork. The cork is thereby not only made air tight, so as to form an air-tight stopper for the bottle, but it is also made stronger and not so liable to crumble. The metal foil increases the diameter of the stopper so little that it will fit easily into the mouth of the bottle, if it did fit without the cap.

STRIKING ATTACHMENT TO CLOCKS.—N. E. Mulford, Madison, N. Y.—This invention relates to a new arrangement for operating the striking part of a clock, and consists chiefly in the arrangement of a heart shaped cam mounted on the spindle of the hour wheel, and in the arrangement of seven pins on face of the hammer wheel, said pins being arranged in a spiral line around the center of the hammer wheel.

PURIFYING AND DECOMPOSING OILS, FATS, ETC.—Richard C. Barton, Brooklyn, N. Y.—This invention relates to a new process for purifying oils and fats and for separating gelatine matter from fish and other oils, and consists more particularly in the use of ferment or protein, which, when added in the necessary proportions to an oil or fat, and when raised in the same to a certain required temyerature, will extract from it all impurities.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

Mt. Sterling, Ill.—A letter dated August 23d, containing $5 came from the above place. No name to the letter. Who sent it, and what for?

W. E. S., of Pa., has a boiler, the shell of which is 40 inches diameter and 16 feet long. He proposes to put in 35 three-inch tubes, and a steam dome on the top to make its capacity 34 H. P. He asks if the boiler, with proper grate surface, will yield that amount. In reply we will state that with 16 square feet of grate surface and the 35 tubes the boiler should give 34 H. P. We think, however, that a better draft and more perfect combustion will be obtained by reducing the length of the boiler to 12 feet.

N. C., of Tenn., E. F. O., of R. I., and W. E. C., of Conn.—The nominal horse-power of the steam engine is worthless to represent its actual power. It is a conventional term having very little significance. The indicator is the only test of engine power.

A. P., of Ky.—Tripoli is a valuable polishing powder, but seems to be of little commercial consequence, and has no established price. It is found in large quantities and of excellent quality in various parts of the country. The sample sent appears to be good.

S. H. P., of Mass.—We believe that boiled linseed oil is clarified and bleached by simmering and skimming and afterward boiling with calcined magnesia and letting it stand until the impurities subside with the magnesia. Another method is to use sulphuric acid.

J. G. P., of Pa.—The lime from tan vats may be removed by washing the surface with a dilute solution of muriatic acid.

H. W. D., of Ind.—Caustic soda and sal. soda are used to soften hard water; but hard water is one of the necessary evils of a new cement cistern.

F. A. J., of Ohio.—If you will read back numbers of the SCIENTIFIC AMERICAN you will find all our ideas in regard to rotary as reciprocating engines. Once for all, we wait as anxiously as anybody for the advent of an economical rotary steam engine. We have yet to see it.

H. S., of Pa.—Aluminum bronze is not a bronze powder, as you imagine. It is a composition of metals used as brass or any other composition. Read our columns and you will see your mistake.

H. W. B., of Pa., asks if the steam in a locomotive cylinder will exert its force to as great advantage in starting a train when the crank is on the lower center as when on the upper. This question has already been extensively discussed in these columns. See back volumes.

A. P. V., of N. Y.—Lead pencils are made of graphite, the purer kinds containing from 90 to 96 per cent of carbon and from 4 to 6 per cent of iron. It is found in Sturbridge, Mass., and many other places. The material is ground fine, exhausted of air, and subjected to great pressure in the form of cakes. Sometimes pure clay is mixed with the plumbago.

E. M., of R. I.—"Do meats or vegetables cook any faster when boiled in a pot if the water boils hard than when it boils gently?" No. You cannot heat water above its boiling point. 212 degrees is all the heat you can obtain at the sea level. When the heat rises above that the water turns into steam.

F. C. C., of Pa.—"Can you inform me why brass or copper thrown into a blacksmith's forge prevents the welding of iron?" Yes. Copper and its alloys contain sulphur which is a disintegrater and destroyer of iron.

M. D. C., of Pa., says that a cement for fastening iron to stone which becomes nearly as hard as the stone itself, consists of 6 parts Portland cement; 1 part powdered lime, not slaked: 2 parts sand, and 1 part slaked lime; mixed with water to the proper consistency, the stone and iron both being previously dampened. In 48 hours it will have set firmly.

H. H. R., of N. Y.—If you wish to learn the art of locomotive engineering go into a locomotive building shop and from thence on the road as fireman. H. C. Baird, 406 Walnut street, Philadelphia, will send you a good Mechanic's Manual.

Business and Personal.

The charge for insertion under this head is one dollar a line.

$500 will be paid for a method of casting large chill rolls, which, upon trial, will be found to overcome the danger of breakage in casting. Address Lock Box 394, Pittsburgh, Pa.

Wanted—1 cotton cord machine for laying cotton or hemp twine, either 3 or 4-fold. Address, stating price, etc., Jabez Hodson & Son, Manayunk, Philadelphia, Pa.

Patent self-closing faucets—a very superior article for water closets, wash basins, sinks, and urinals. J. Zane & Co., plumbers, 81 Sudbury st., Boston, Mass.

Important!—How to exterminate midgets, or gray hen lice, in henceries—send 25 cents for recipe to G. F. Wright, Box 8, Clinton, Mass.

Wanted—terms for air pumps of various sizes for hand and machine power. Address "Air Pumps," P. O. Box 773, New York.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, has just published:—"A Hand Book of Practical Gaging." To which is added a Chapter on Distillation, describing the process in operation at the Custom House for ascertaining the strength of Wines. By J. B. Keene. Price $1 25 by mail, free of postage.

The Franklin Institute system of bolts and nuts, drawn full size, and sent to any address, postpaid, on receipt of two dollars, by Edward Lyman, engineer and draftsman, New Haven, Ct. Circular sent free.

A responsible man desires the agency of some staple article for the West; or would attend to any business that may be intrusted to him. Address, at once, box 776, West Meriden, Conn.

Manufacturers of combs please send address to Theodore Schreiber, box No. 522, Wheeling, W. Va

Wanted—A circular sawyer. One who thoroughly understands his business will have regular employment. He must produce testimonials from late employer as to competency. Address G. A. M., box 428, New York.

To Proprietors of boiler works.—A young man of several years' theoretical and practical experience, and still employed as a superintendent of extensive boiler works, desires a similar situation. Address A. W. R., Philadelphia Democrat office, No. 465 North 3d st., Phila., Pa.

Wanted to purchase—the necessary machinery for manufacturing parlor matches. Address Zeitung, Charleston, S. C.

Models and light machinery in brass or iron. Clauson & Tucker, No. 3 Alling st., Newark, N. J.

For improved double and single-roll carding machines, seven roll rubbers, twisters, card grinders, etc., address Union Iron Works, Rhinebeck, N. Y.

Spring-bed bottom—cheapest and best in use. Responsible Agents wanted in each State. Address S. C. Jennings, Wautoma, Wis.

One half of patent right of Wyatt's mode of reefing top gallant sails given for obtaining patent in England. Geo. Hart, New Bedford, Mass.

Mill-stone dressing diamond machine, simple, effective, and durable. Also, Glaziers' diamonds, and for all mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

The surest detective of low and high water, and high steam in boilers yet invented. Springer, Hess & Co., Philadelphia, Pa.

Paper Makers, Tanners, etc., wanting the Best and Cheapest Pump in use will send for Circular to Heald, Sisco & Co., at Baldwinsville N. Y. Agents wanted.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Engineering facts and figures for 1867, mailed on receipt of $3. John Penington & Son, 127 S. 7th st., Philadelphia, Pa.

Entire, State, or shop rights for three new first-class toys for sale. Send 50c. for samples to J. Pusey, 700 Spring-Garden st., Philadelphia

EXTENSION NOTICES.

Lavinia L. Bartlett, administratrix of the estate of Russell D. Bartlett, deceased, of Bangor, Me., having petitioned for the extension of a patent granted to the said Russell D. Bartlett the 11th day of July, 1854, for an improvement in machine for making the heads of shovel handles, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Rebecca B. Gillett, administratrix of the estate of Thomas W. Gillett, deceased, of Chicago, Ill., having petitioned for the extension of a patent granted to John Matthews as assignee of the said Thomas W. Gillett the 11th day of July, 1854, for an improvement in apparatus for corking bottles, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Asa Oliver Butman, administrator of the estate of James A. Cutting, deceased, of Boston, Mass., having petitioned for the extension of a patent granted to the said James A. Cutting the 11th day of July, 1854, for an improvement in composition for making photographic pictures, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday the 29th day of June next.

Albert H. Tingley, of Providence, R. I., having petitioned for the extension of a patent granted to him and his co-assignee, Edmund W. Tingley, the 18th day of July, 1854, for an improvement in machines for sawing stone and marble, for seven years from the expiration of said patent, which takes place on the 18th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

R. H. Garrigues, administrator of the estate of L. A. Dole, deceased, of Salem, Ohio, having petitioned for the extension of a patent granted to the said L. A. Dole the 25th day of July, 1854, for an improvement in arrangement for lathe chucks, for seven years from the expiration of said patent, which takes place on the 25th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 6th day of July next.

Wm. S. Chapman, of Wilmington, Del., having petitioned for the extension of a patent granted to him the 8th day of August, 1854, for an improvement in preventing rattling in carriages, for seven years from the expiration of said patent, which takes place 8th day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 20th day of July next.

Norman Millington, of Shaftsbury, Vt., having petitioned for the extension of a patent granted to him the 8th day of August, 1854, for an improvement in machine for graduating carpenters' squares, for seven years from the expiraton of said patent, which takes place on the 8th day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 20th day of July next.

Elliot Savage, of Meriden, Conn., having petitioned for the extension of a patent granted to him the 11st day of November, 1854, and reissued in two divisions the 27th day of September, 1859, and numbered respectively 826 and 827 for an improvement in machines for threading screw blanks, for seven years from the expiration of said patent, which takes place on the 21st day of November, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 24th day of August next.

NEW PUBLICATIONS.

ENGINEERING FACTS AND FIGURES FOR 1867. Illustrated. John Penington & Son, 127 South Seventh street, Philadelphia.

A handy volume of about 400 pages, illustrated with plates and engravings of mechanical subjects, intended to show the advancement made in the arts and sciences during the past year, especially noting the exhibition of improvements made in the great exposition at Paris. Much of the work is made up from articles which appeared in the SCIENTIFIC AMERICAN and kindred periodicals (to which due credit has been given), and they are presented in a very convenient and concise form.

ANNUAL OF SCIENTIFIC DISCOVERY; a year-book of Science and Art for 1868. Gould & Lincoln, 59 Washington street, Boston.

This is a volume, as its title denotes, containing some account of all the important discoveries and improvements in mechanics and the useful arts, natural philosophy, chemistry, astronomy, geology, etc., beside notices of the lives of eminent scientific men deceased within the year, a fine engraving of Prof. Wm. B. Rogers, LL.D., President of the Massachusetts Institute of Technology, and other interesting matter. It is a valuable annual to the scientific or mechanical student for reference. This and the previous volumes from its commencement should be in every library. For a number of years this work was ably edited by Hon. D. A. Wells, now holding the office of Commissioner of Revenues.

EXPLORATION OF THE NILE TRIBUTARIES OF ABYSSINIA. By Sir S. W. Baker, M. A., F. R. G. S. Hartford: O. D. Case & Co. 1868. 608 pages; price $3.50.

The thick cloud of mystery which has so long hung over the Nile is being gradually and completely dispelled by the explorations of the scientific traveler. We are now no longer left in uncertainty as to what supplies its main stream, or the cause of its periodical overflow and fertilizing influence. To such men as Speke, Grant, and Baker we are indebted for the solution of questions which have for centuries puzzled the world. In "The Albert N'yanza Great Basin of the Nile," published by Sir Samuel in 1866, we have an account of the grand reservoirs—the equatorial lake system—from which the Nile issues. In the present volume he describes twelve months of his journey during which he explored the Abyssinian tributaries, the sudden rush of muddy waters which, in July, August, and September, causes the inundation which irrigates and fertilizes Egypt. We may mention, as an element of interest in Baker's African explorations, that he was accompanied during the whole journey by his wife. The narrative is often exciting, always instructive, and never dry. A certain wild, open-air sort of freedom pervading the style might naturally be expected in the writings of one who has spent the greater part of his life in travel and adventure. The engravings and maps serve not only as embellishments but as valuable illustrations of the text. The book is elegantly printed and will be found a pleasing addition to the family library.

THE PUBLIC LEDGER BUILDING.

To Geo. W. Childs, Esq., proprietor of the Ledger Newspaper Establishment, Philadelphia, we are indebted for a handsome volume of nearly 200 pages, giving an account of the proceedings at the banquet given at the opening of the elegant new iron *Ledger* building on Chestnut street last June. The energetic, systematic, and business qualities, are seldom found in such complete harmony as they are exhibited in Mr. Childs. In every morning's issue of the *Ledger* is evinced the industry of its proprietor, and the fine intrinsic taste of the author is forcibly shown in the volume before us. A truthful steel plate vignette of Mr. Childs, delineating to a wonderful degree the benevolence and good nature which characterize him among his acquaintances, graces as it should the first page of the volume, and then follows interspersed through its pages a large number of wood engravings of the press vaults, compositors' rooms, editorial rooms, and other apartments pertaining to a first-class daily paper.

THE ECLECTIC MAGAZINE. W. H. Bidwell & Co., No. 5 Beekman street, New York.

For twenty-five years the "Eclectic" has been published, and is the oldest magazine, we believe, in this country. It makes no claim to originality, but is made up mostly from selections from foreign reviews. Every number contains a fine steel-plate portrait of some distinguished person. The May number has a portrait of Earl Albemarle, with a sketch of his life by the editor. $5 per annum; 45 cents, single numbers.

THE BROADWAY. May. Routledge & Sons, 416 Broome street, New York.

This is the only illustrated magazine that comes to our sanctum. It is published monthly, and may be had at the news stands for 25 cents a copy.

PUBLIC SPIRIT. Le Grand Benedict, 37 Park Row, New York.

This monthly improves with each issue. The May number, just out, is well worth its price—25 cents.

THE NEW ECLECTIC. Turnbull & Murdoch, 49 Lexington street, Baltimore, Md. Price $4 per annum. Monthly.

The May number of this new magazine of select literature is just out.

ATLANTIC MONTHLY. Ticknor & Fields, Boston.

Four dollars per annum; 35c. single copies. May number out.

ALLEN'S CATALOGUE.

R. H. Allen & Co., 189 Water street, New York, have just issued an illustrated catalogue of agricultural implements, machinery, and hardware, adapted to the farm and plantation. The book contains 270 pages and 350 engravings, handsomely printed on cream colored paper. Price

Improved Device for Drying and Cooling Flour.

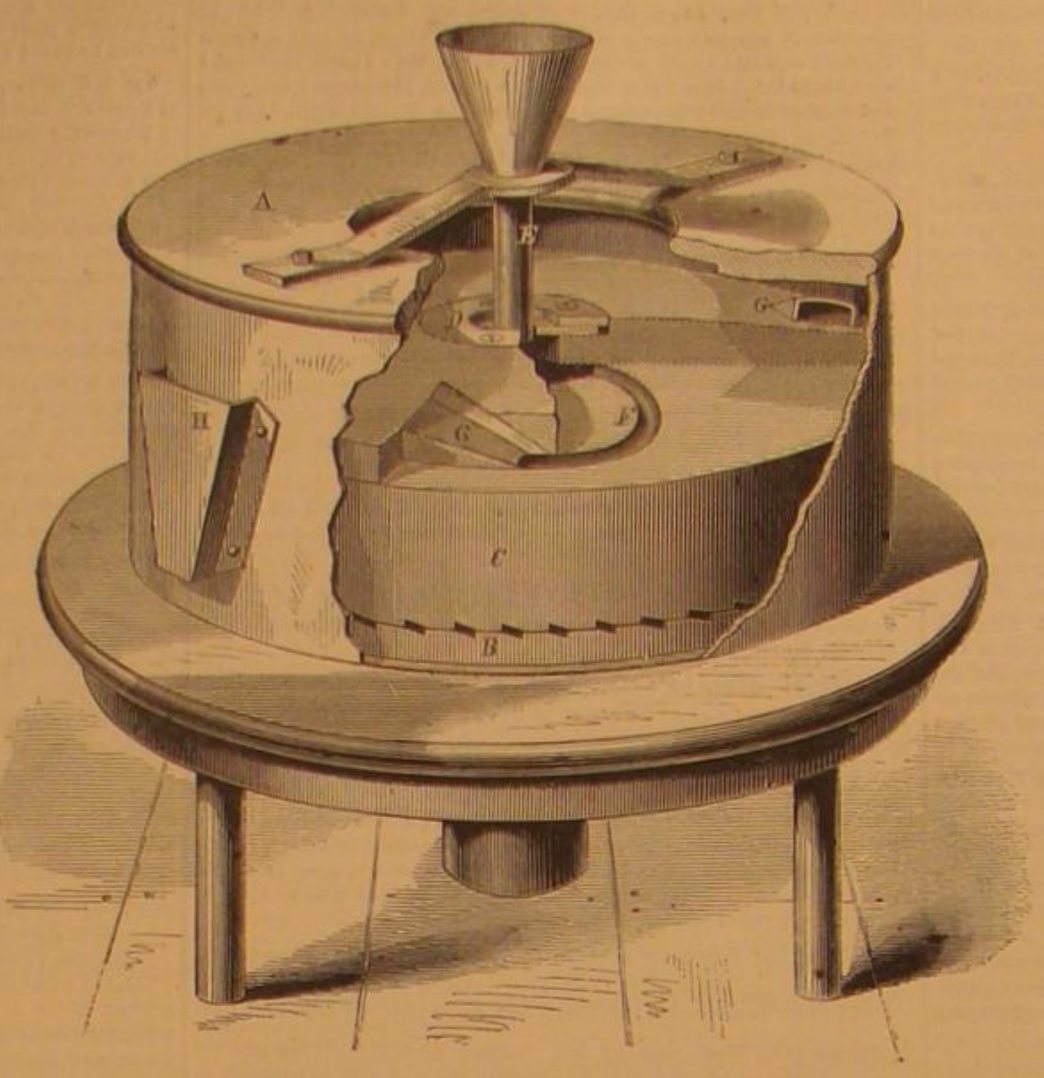
The invention represented in the engraving is a new and useful arrangement of a device for conducting fresh air between a pair of mill stones and expelling it from the curb, for the purpose of cooling the stones and carrying away the vapor arising from friction in grinding grain; thereby, it is claimed, increasing the capacity of the stones from fifteen to twenty-five per cent, saving a proportionate amount of fuel in steam mills and power in water mills. It is intended also to prevent the stones from injuring the color of the flour by becoming overheated, and to leave it in a dry state so as to diminish the danger of spoiling.

Expelling the air from the curbs, that portion of the meal that by the usual process is lost in being allowed to lie and rot in the curb, is saved; no inconsiderable item to proprietors of mills.

In the engraving, A is the curb of a run of mill stones, B the bed stone, and C the runner. In the eye of the runner are two metal flanges, D being one, between which is held a washer of leather or some other elastic material that envelopes the feed tube, E, preventing any access of air at tl is point. Tubes, shown in the engraving at F, are let into the back of the runner, leading to the eye, the opposite ends communicating with the hoods, G, at the skirt of the runner, so that they shall catch the air as the upper stone or runner revolves, and force it in through the pipes, F, to the eye of the stone, and thence, with the grain, down between the runner and bedstone, the flanges and leather disk around the feed pipe preventing escape in this direction. Around the inside of the curb a circle of leather or some other pliable substance bears against the runner to prevent the escape of the heated air in this direction; it is forced through two or more vent holes, H, which may have pipes connected to lead the vapor and hot air away from the curb.

The currents of air, thus carry off the heat generated by friction, and also the vapor arising from the grain, delivering the product in good order.

Patented through the Scientific American Patent Agency, January 28, 1868. All orders should be addressed to Campbell and Brown. Box 2,894 St. Louis, Mo. The device is highly recommended by practical millers who are using it.



CAMPBELL'S AUTOMATIC COOLER FOR MILL STONES.

Improvement in Power Measurers.

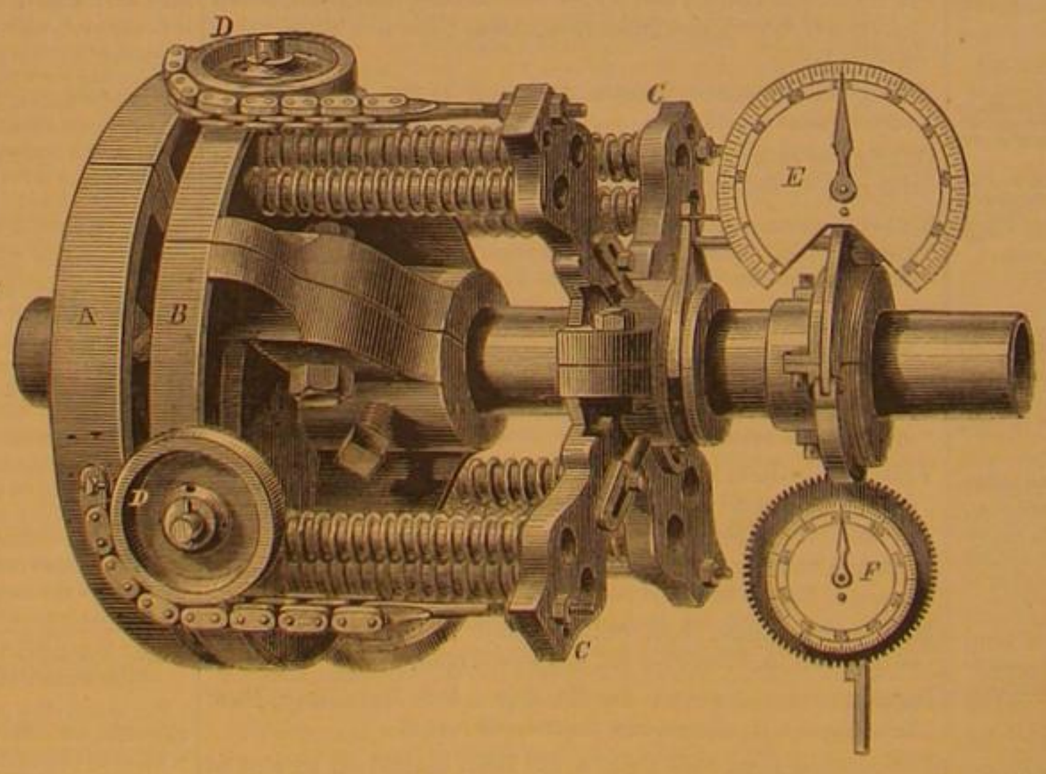
In No. 16, present volume, we inserted an article on the "Absorption and Transmission of Power," with a closing paragraph expressing the desire that some reliable power measurer, giving the actual amount transmitted by belts, should be invented. Since then we have seen the apparatus illustrated in the engraving accompanying this article and witnessed its operation. It appears to answer the demand, as it really weighs the power exerted on a main or counter shaft and records it on a dial, the face of which is in plain sight. In fact it is an adaptation of the spring balance, differently applied of course, but operating on the same principle.

The dynamometer usually known as Neer's is, in construction and operation, quite different from the one herewith illustrated. That had rather a limited range and was liable to get out of order unless nicely adjusted and carefully attended to. This, however, is a new machine patented only a year ago—January 15, 1867—and is attached directly to the shaft without the intervention of belts, and the whole power is transmitted directly through the machine.

Part A in the engraving is a disk, halved across its diameter for convenience of placing it on the shaft without removing couplings. It is attached by steel set screws to the hub of the driving or driven pulley, or of a coupling, the set screws or key of the pulley being removed to allow it to turn easily on the shaft, so that the dynamometer, itself, becomes the medium through which the power is transmitted. B is a similar disk, also halved, carrying on its periphery two, three, or more rollers, turning on studs seated in the rim of B, and having triple linked machine chains of hardened steel passing over them, the other ends of which are attached to the arms, C, the hub of which is halved similar to A and B. These—B and C—act together, revolving with the shaft, while the disk, A, revolves with the pulley to which it is secured. Tempered steel spring surround bolts between B and C, which springs are expanded or contracted through the medium of the chains and the rollers, D.

As the resistance to the power increases, the shaft, and with it the disk, B, slackens in speed and the springs are allowed to act on the arms, C, against which they bear, actuating a pointer on the dial, E, by means of a cord passing over a whirr to the shaft of which the pointer is secured, fastened at the other end to a forked clutch fitting the hub of C. A gland with a worm turning with the shaft carries a strap similar to an eccentric strap, which, with the clutch, remains in one position as the shaft revolves, the gland and worm revolving with the shaft, and, by means of a gear meshing into the worm, showing on the lower dial, F, the register of the power used. This worm gear may be made of any number of teeth, and as it is plain it can move but one tooth to a revolution of the shaft it becomes a perpetual record of the amount of power used in a given time, while the upper dial, E, shows momentary variation in the power absorbed.

By this machine it is easy to know at any time the amount of power being used by any line of shafting to which it is attached. One of them may be seen in operation at E. P. Gleason's, 135 Mercer street, this city, and all orders for machines or for measuring power should be addressed to Geo. C. Roundey, No. 254 Broadway, New York city, where the dynamometer may be examined as a whole or in its parts.



NEER'S PATENT DYNAMOMETER.

Microscopical Examination of Damaged and Valuable Papers.

The Buffalo *Medical and Surgical Journal* reports the following extract from a lecture delivered by Dr. E. H. Parker of Poughkeepsie, before the New York Medical Society, the remarks being occasioned by an investigation the Doctor had made in two very interesting cases of forgery to which he had been called as an expert:—

The first was one in which it was an alleged promissory note, signed by a blind man who had deceased. The gentleman in question had become blind by cataract, but was nevertheless in the habit of signing all important papers. The body of this note was written by a different hand, in blue ink, and the name in black ink. The question came up as to whether the body of the said note was written before that of the signature or not.

The paper folded end to end across the middle. Prints of black ink were transferred from the black signature, and were found on the opposite side. In several places the blue and black ink of the dots were in conjunction. It was impossible to tell which was put on last, till a place was found where the bottom of a letter *y* and tip of a letter *h* came together over a dot, and showed the blue ink on top.

The same paper read, "*one day* after my death I promise to pay," etc. It showed clearly under the microscope that it had been written "one *year*," an erasure having been made, and *day* written in.

The other paper was an alleged receipt for $2,000, paid on May 11th. That amount had been paid May 1st, and this alleged payment was denied to have been made. Examination by microscope showed that the first figure 1 of the date was in *brown*-black ink, while the second and the rest of the paper were in *blue*-black ink. Transfer had been made of the *brown*-black ink to the other end of the paper by folding, showing that it was put on last. The two shades of black show only under the microscope; to the naked eye they are alike.

Dr. Squibb, in this connection, referred to the following case: A number of U. S. bonds were stolen some time since from a party, and their payment stopped. For a long period nothing could be discovered in relation to them. Finally, however, two bonds with the same numbers were found in Wall street, and it occurred to the parties concerned that one of these must be of the lot that had been stolen. The difficulty was to decide which was the genuine, and it was cleared up by a microscopical examination of the ruled lines upon which the figures were written in red ink. The magnifying glass showed the tracings of the old figures underneath the new, the red ink of the former having been previously removed by a chemical process.

Turkish Hair Dye.

In answer to a number of correspondents inquiring for information as to the best preparation for coloring the hair, we give the following from the pen of Septimus Piesse, a practical chemist and perfumer in London:

In Constantinople there are some persons, particularly Armenians, who devote themselves to the preparation of cosmetics, and obtain large sums of money from those desirous of learning this art. Amongst these cosmetics is a black dye for the hair, which, according to M. Landerer of Athens, is prepared in the following manner:

Finely pulverized galls are kneaded with a little oil to a paste, which is roasted in an iron pan until the oil vapors cease to evolve, upon which the residue is triturated with water into a paste, and heated again to dryness. At the same time a metallic mixture, which is brought from Egypt to the commercial marts of the East, and which is termed in Turkish *Rastikopetra*, or *Rastik-Yuzi*, is employed for this purpose. This metal, which looks like dross, is by some Armenians intentionally fused, and consists of iron and copper. It obtains its name from its use in dyeing or staining the hair, and particularly the eyebrows—for *rastik* means eyebrows, and *yuzi* stone. The fine powder of this metal is as intimately mixed as possible with the moistened gall mass into a paste, which is preserved in a damp place, by which it acquires the blackening property In some cases this mass is mixed with the powder of odorous substances which are used in the seraglio as perfumes, and called *karsi*—that is, pleasant odor; and of these the principal ingredient is ambergris. To blacken the hair, a little of this dye is triturated in the hand or between the fingers, with which the hair or beard is well rubbed. After a few days the hair becomes very beautifully black, and it is a real pleasure to see such fine black beards as are met with in the East among the turks who use this black dye. Another and important advantage in the use of this dye consists herein, that the hair remains soft, pliant, and for a long time black, when it has once been dyed with this substance. That the coloring properties of this dye are to be chiefly ascribed to the pyrogallic acid, which can be formed by treating the mass with water, may be with certainty assumed.

Process of Preparing Coffee.

In the process of roasting coffee, as ordinarily practiced, much of the aroma is dissipated, and the quality of the coffee is impaired. This invention is to obviate these objections. In a suitable vessel place a quantity of olive or other oil, butter, or animal fat, and raise the same to a temperature of, preferably, 400° Fah., whereupon the green coffee is placed therein, and subjected to the cooking or boiling action of the heated oil or material for about five minutes. The coffee is then removed and placed upon a suitable strainer to drain and cool. The coffee being surrounded by unctuous matter during its preparation, the escape of the aroma is prevented; and inasmuch as the oil may be readily kept at the desired temperature during the whole operation, any injury to the quality of the coffee by excessive heating is also prevented. The oil, butter, or other like material, after being once heated, may be used repeatedly for different quantities or batches of coffee. Patented by Benj. T. Babbitt, New York city

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York
☞ "The New York News Company," 8 Spruce street
☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents of the SCIENTIFIC AMERICAN.
☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XVIII., No. 19....[NEW SERIES.]..*Twenty-third Year.*

NEW YORK, SATURDAY, MAY 9, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Device for Removing Seeds and Pits from Fruit 289
Telegraph Insulation 298
Improvement in Coating Metals .. 298
Manufacture of Whiting and Paris White 289
Editorial Correspondence 290
Steel and Iron Rails 291
A Literary Bureau Wanted 291
Insecurity of Buildings—Protection from Fire 291
Atmospheric Temperature and Snow 291
Steam Economy 291
Aluminum Bronze 291
Neutral Acetate of Lead 291
How is a Ball kept in a Fountain Jet? 291
Parasites on Insects and other Animals 292
Polygons 292
*Improved Attachment to Mowing and Reaping Machines 292
*Telescopic Speaking Trumpet 292
*Martin's Patent Safety Swing 292
*A Flying Parachute 292
*Another Optical Illusion 292
*Locke's Self Lighting Gas Burner 293
Pictorial Printing 293
*The Construction of Watches 293
Manufacturing, Mining, and Railroad Items 294
Recent American and Foreign Patents 294
Answers to Correspondents 295
Extension Notices 295
New Publications 295
*Improved Device for Drying and Cooling Flour 296
*Improvement in Power Measures 296
Microscopical Examination of Damaged and Valuable Papers 296
Turkish Hair Dye 296
Process of Preparing Coffee 296
Constructive Mechanics and Educational Means 297
Forging by Drops and by Hammering 297
Water Meters 297
The Wheel Question 297
To Inquiring Correspondents 297
The Polytechnic Club of the American Institute 297
Patent Claims 298, 299, 300, 301, 302
Pending Applications for Reissues 302
Inventions Patented in England by Americans 302

CONSTRUCTIVE MECHANICS AND EDUCATIONAL MEANS.

Said a skillful and successful inventor to us lately, when we were congratulating him upon his having accomplished a difficult feat of hydraulic engineering, the reward of many years of study and costly experiment: "If I never should regain a dollar I have expended upon this problem, I have received a certain amount of education at a cheaper rate than I paid in my youth at the schools for rudimentary instruction," and, he added, "I should have had this return if I had been unsuccessful in my special attempt."

We understood his meaning to be that the knowledge, acquired skill, and the mental development obtained by his researches, and his efforts to bring about a definite mechanical result were, aside from the pecuniary benefits that might rearonably be expected to attend its successful accomplishment, a sufficient remuneration for the time, labor, and money expended.

The remark led us to consider the adaptability of invention to educational purposes, and the practicability of its introduction for that purpose into schools of mining and engineering. The result of our reflections, has been to assure us of the entire practicability of its adoption for that purpose, of the possibility of a good text book upon the subject, and its great educational value.

A discovery is not, properly speaking, an invention, although the meanings of the terms are frequently confounded. The former may happen, the latter is never directly the result of a coincidence. The first may result from observation alone, the second is a conclusion reached by a train of reasoning as severe and logical as a geometrical demonstration. Chemistry is at present the principal domain of physical discovery, and constructive mechanics, is the chief field of invention. "Constructive Mechanics" would not be an inappropriate title for the proposed text book. Mechanics, as now taught in the schools, treat of the natural laws which underlie and constitute the philosophy of the elements of machinery. Constructive mechanics should go further than this. It should not only treat of motors, motion, and the conversion of motion, but should teach the different devices for changing the direction of motion and its communication from one body to another, and the philosophy of these devices. It should give rules for the criticism of mechanical structures, and supply specifications to be reduced to drawings for the application of these rules. It should classify materials according to their mechanical properties, and give the chemical and physical characteristics of each as minutely and concisely as possible, with a brief reference to such imperfectly known substances as may probably be determined by future investigation to be valuable for constructive purposes.

Finally, it should give problems of construction, combining the general conditions of the precise work to be accomplished and the peculiar limiting circumstances under which it is to be performed, to be solved, and the answer given in drawings and specifications of the device which it is claimed will perform the service or labor required. To enable the student to grapple easily with such problems, it should teach him how to analyze the main problem into its subordinate problems, and to generalize them so that the solution of these minor elements shall apply not only to the machine adapted to accomplish the specified purpose, but to any other machine in which the minor device is, or may become an element.

We are confident that such discipline would develop the mental powers more than any other method, and might be admitted with great propriety and benefit into the latter part of the course of instruction, in schools of mining and engineering. If there exist any valid objections to our views of this subject we have failed to discover them, and should be happy to have them suggested, should any be found by others who may peruse this article.

FORGING BY DROPS AND BY HAMMERING.

Of late years the drop has become an almost indispensable tool for the manufacture of small articles of iron and steel, as the parts of machinery, firearms, etc. Its operation in connection with properly made matrices and dies, is so perfect, reproducing almost infinitely the form in its exactness and leaving the material in excellent shape for after working, that it would hardly seem it could ever be greatly improved, much less be superseded. Yet we have lately heard practical and observing mechanics express doubts of the perfection of the drop, and suggest that hammering in connection with dies would be preferable. The idea, it seems to us is worthy of consideration and examination. While it may not be that a sudden, single, heavy blow, violently disturbing and re-arranging the particles of iron or steel will materially injure the metal—deteriorate its quality—yet it is well known that iron and steel are improved by judicious hammering.

In some cases the drop is used several times on the same piece of metal; one die giving it the first crude, undeveloped form, another heating and the next die bringing it to an advanced stage, a proceeding repeated perhaps once, twice, or thrice more. This repetition may serve a similar purpose to tilting or hammering, toughening and refining the metal. But this repetition, being at the most but four or five very heavy blows, can have no such effect on the metal as rapid, light blows repeated indefinitely. The drop may condense the metal, but it can hardly refine or toughen it. If the interior of the bar from which the article is formed contains impurities they cannot be driven out by the action of the drop, nor can a semi-crystalline structure be made fibrous; the only safety for the good quality of the product is an assurance of the original excellence of the iron or steel. The advantages of the drop, however, in rapidity of work and perfection of form of the product, justify its very extended use, and tempt to its employment where, perhaps, a somewhat slower process will produce more perfect results.

In regard to the best material for drop dies there is some difference of opinion. Usually they are made of steel—refined cast steel—but these break so frequently that their renewal is a large item of expense. If the article to be dropped is of a wedge like form, however slight, the edge bevel and the outward pressure in the combination with the shock of the blow, tend to split the die, so that if the metal fills the matrix or tends to spread, the dies will be very short lived. We have heard practical operators assert that it is better the metal should more than fill, than that it should exactly fill or fall a little short, alleging as a reason that the sprew which spreads on each side forms a cushion of soft metal for the reception of the drop, preserving both it and the die. There is, at least, a show of reason in this, as the steel or iron is worked red hot—in which state the finished article often leaves the drop—and is consequently soft. But lately we have been informed that strapping the dies with tough wrought iron adds immensely to their endurance, the hoops being shrunk on after the dies are otherwise finished. This appears to be a very sensible recomendation. Further we are told that Swedish, Lowmoor, or other tough iron is superior to the best steel for endurance, while it can be worked by the die sinker as readily. This may be correct, as the iron or steel worked under the drop is always worked at a red heat or higher. One use of the drop, not perhaps generally known, is in finishing surfaces while cold. The article is placed in a die and the polished steel face of the drop hammer allowed to come in violent contact with it. The effect is to condense the particles of the surface, leaving it in excellent condition for polishing.

It may be that notwithstanding the apparent advantages of the drop, many articles now formed—we can hardly say forged—by it might be improved in quality by the substitution of one of the rapidly acting power-hammers now so justly in favor with mechanics. This consideration, we think, is well worthy the attention of our mechanics.

WATER METERS.

As the population of our larger cities increases, and the use of water increases in consequence, a constant and sufficient supply is a subject of great moment, and of growing anxiety to Boards of Commissioners and corporations. A method of equitable assessments, and a mode of preventing the enormous waste consequent upon the general and often wanton carelessness of consumers has become a desideratum.

A careful consideration of the subject, together with an examination of the reports of superintendents of different works, and the opinions of those who have given it great attention is sufficient to convince us that meters are the only means of accomplishing these objects.

The demand for water meters has existed for a considerable period in this country, and for a still longer period abroad, and a large number of inventions have been made to meet it. Occasionally some of these devices have been adopted by corporations, only to prove themselves unequal to the requirements of the case, and to be eventually thrown aside as worthless. In a few instances meters have been adopted because they would answer some good purpose, but nothing has yet been devised, and adopted that has proved itself to be what is wanted for general introduction and use.

The advantages that would accrue to all parties by the invention and adoption of such an instrument would render it one of the most valuable improvements of the age; but the difficulties of constructing a good water meter are so great and the conditions to be observed so numerous, that they are exceeded by very few mechanical problems. For the benefit of our readers whose minds may be directed to this subject, we here state what we understand to be the principal requisites of a water meter adapted to general use. It should be cheap. Its cost should not greatly exceed the cost of a gas meter, of a size suited to the dwelling or other building in which it is to be placed. It should be sufficiently accurate; that is, it should indicate with little variation the actual amount which passes through the service to which it is attached. It should be beyond all question durable, that is, It should be able to withstand the wear and tear of at least ten or twelve years' service.

The above-named, are the primary requisites, but to secure them, a host of obstacles must be surmounted, and if a meter is to be constructed that will answer for the measurement o oils and liquors, as well as for water, the difficulties are greatly increased. These difficulties consist in the selection of proper materials, so that neither the quality of the fluid to be measured, nor the instrument itself, shall be injured by mechanical action arising from grit or other foreign matters, or by the corrosive action of substances held in solution; the compensation for variations in pressure and temperature; the balancing of valves; the stopping of leaks through stuffing boxes; the protection from injury by frost; the making of an instrument in a sufficiently compact form to withstand the pressure of the great head to which meters are often subjected; avoiding the use of much head to work them; the non-interruption of the stream, so that the stream shall flow equally and not in spirts; capability of being placed back of all faucets in any building, block, or blocks of buildings, and registering equally well for one, or more, or all of them, together, etc.

The attempts which have been made to overcome these may be classed into four groups. Rotary meters, diaphragm meters, plunger meters, oscillating meters. Each of these groups comprise numerous devices which have been made the subjects of many letters patent, and a glance at the records for the past year will show that the number is still increasing. It is safe to say, however, that the device which will fully meet with the requirements of the case is not yet introduced, and that the field is an open one for the man who is successful in inventing it. Cheapness, simplicity of construction, and correctness in registering, are the grand requisites of a good meter.

THE WHEEL QUESTION.

Our readers are aware that we have set apart a special publication, entitled "THE WHEEL," for the purpose of presenting in handsome style, the views of the many writers whose letters we are unable, for want of space, to print in any other manner. Part first of "THE WHEEL" is to be issued May 15th, and it promises to be entertaining.

We have already received a variety of contributions, most of which are to be illustrated with diagrams, so that the views of the writers will be presented in a very intelligible and attractive manner.

The pages of "THE WHEEL" are open to all who choose to take part in the Wheel discussion, or who wish to present ideas, in their own way, upon any other scientific question. The only requirement is that each writer shall pay the cost of his type setting and diagrams. The expense for type is at the rate of $2 50 per printed page, 56 lines, 12 words to a line. Correspondents may thus easily reckon the amount and will please remit the same with their communications.

TO INQUIRING CORRESPONDENTS.

We are constantly receiving letters asking such questions as these: Who is the manufacturer of the best and cheapest stocking loom? Which is the best sewing machine? Who makes drain tiles and water pipes of the finest quality? Whose brick machine can you confidently recommend? A moment's consideration will convince our correspondents that a compliance with thousands of such requests would subject us to a responsibility which we do not feel called upon to assume. We are quite aware that information of this nature may be of the utmost importance to individuals, and, with a view of giving a legitimate and effective means of obtaining it, we have devoted a portion of our space to a certain class of advertisements, under the title "Business and Personal," to which we direct the attention of correspondents. A few lines under this heading will put the advertisers in communication with inventors and manufacturers throughout the world, and bring out satisfactory replies not obtainable in any other way.

THE POLYTECHNIC CLUB OF THE AMERICAN INSTITUTE.

For some time past we have omitted notice of the meetings of the above organization, except when the discussions were worth reporting. Last year we had occasion to allude to the irreligious tendencies of some persons who were allowed to speak, and protested against the atheistic theories sometimes propounded, which protest had at least the good result of calling forth a declaration of disapproval of such doctrines by the prominent men of that organization. Then came several long-winded lectures of a certain individual on ocean currents, upheaving of continents, etc., which, singularly enough, we find fully reported in the published transactions of the American Institute, and are now a standing memento, not only of the deficient scientific training of its author, but also of those who allowed the publication.

The Institute is again going astray. The attention of the Club has lately been given up to a long discourse of a spiritualistic-minded individual, about a new science discovered by him, and a new language invented by him. Notwithstanding he spoke, and read extracts from his book (in the course

of publication), for about two hours, the audience left in utter ignorance of what the science consisted in, and after reading the whole book one may not know any thing more, as probably the extracts read are fair specimens of the rest; notwithstanding the speaker was urgently pressed by some members present to give at least some idea of the principles of the new science, all they could find out was, that its name will be *Universalogy;* that it will be above all other sciences, generalize them, supercede them all, and make even the study of them unnecessary, as it will teach them all by one single principle.

The speaker reminded us very much of the ancient alchemists, seeking for the elixir of life, which would make all other medicines superfluous, would give perfect health, etc. They were sure that such a medicine must exist, and can be found; some supposed they had got it. Just so the speaker mentioned is confident that such a science exists, that it can be found; in fact, that he has got it; that it will give perfect wisdom, make other learning superfluous, etc.

Thus far sciences have been generated and slowly developed after a laborious process by many minds, during several generations. The knowledge existed among the investigating class of men before the sum total of cognate truths had obtained a name, and then the new science appeared as a bashful maiden among her sister sciences, never boasting of what it would do; in fact, being utterly unconscious of its power, it never stated what it might do. Here, to the contrary, we have a single individual, who blows the trumpet about a new science discovered and developed by him alone, and, after all, he divulges nothing about it but the name and what it will do; we are utterly astonished at such vanity and conceit, and still more surprised that the Institute managers will permit such folly under their auspices.

The last quality becomes still more apparent by learning that the same individual has also invented a new language, to be studied and adopted by all mankind; it is destined to be universal, and to supercede the now existing and very inconvenient variety of languages over all the world. It is based on a simplification of the words which are now unnecessarily long, and too arbitrary. We can do with less letters if they are only combined systematically; for instance, in place of the arbitrary words and sounds, one, two, three, four, five, etc., we may say, ba, be, bi, bo, bu, da, de, di, do, du, fa, fe, fi, fo, fu, etc. Those are not the correct names, but it is about the manner in which the new language is compounded, avoiding the use of long words, as the twenty-five letters may be combined two and two in six hundred ways, and three and three in fifteen thousand ways, etc.

Perhaps we are too severe; perhaps the man only deserves our pity. The reader will probably have already come to the conclusion what is the matter with him.

On Thursday, April 10th, a gentleman read a long paper on terrestrial magnetism, and announced with a flourish almost equal to that of the preceding person, that he also had made an important discovery, namely; that the magnetic pole turned slowly around the geographic pole; a fact known a century ago, and stated in most books on natural philosophy. To the utter amazement of the learned individual, a member present stated this at the end of the reading of his long-winded paper, in which a new theory was expounded to explain the facts, mixing up magnetism, electricity, and gravitation, in the most absurd manner. It was asserted in this paper that all rotation was necessarily spiral, that the electricity passes instantaneously through the Atlantic Cable, and that the time of 0·6 seconds, reported to be found by experiment, was only the time it took the experimenters to record their observations; he made several other statements, partially absurd, and partially proving his lack of information about matters pertaining to the natural sciences, and finally mentioned that he intended to publish his paper to the scientific world, on which point we give the same short answer that the London *Punch* lately gave to a correspondent who asked his advice about getting married, namely: *"Don't."*

In order that the Polytechnic Club should be what the name suggests, the presiding officer should, in case persons apply with whose status in scientific matters he is not acquainted, take a look at the papers to be presented, in order not to cause the disappointment of a large number of persons, who come there to obtain useful information and to prevent the propagation of errors, and of crude or obsolete notions.

It may be answered that such may be, and usually are corrected at the same or on succeeding nights; but then we say that it is, if not a direct loss of time, at least, that the time could be better employed, than to listen for one hour to erroneous views, and then to spend another hour to hear them corrected.

Surely a steady atttendance of the right kind of listeners could be secured, were the public only sure that something useful and instructive would always be presented. As the case now stands, we know of many persons, even members of the association, who stay away, and some even who have been frightened away, by the crude and absurd notions of some people allowed to speak there, or by peddlers who wish to advertise their wares.

SILVERING HOOKS AND EYES. A patent has been granted in Bavaria, for the following method of silvering hooks and eyes made of iron wire. The articles are suspended in dilute sulphuric acid until the iron shows a clean, bright surface. After rinsing in pure water, they are placed in a bath of a mixed solution of sulphate of zinc, sulphate of copper and cyanide of potassium, and here remain until they receive a bright coating of brass. Lastly, they are transferred to a bath of nitrate of silver, cyanide of potassium and sulphate of soda, in which they quickly receive a coating of silver.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING APRIL 21, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,875.—FAN.—Seymour Ainsworth, Saratoga Springs, N. Y.

I claim, as a new article of manufacture, a fan, composed of the buckram foundation, covered with quill feathers throughout its center, on both sides, trimmed on its edge with down, and provided with a handle, attached substantially as described, the whole constructed and shaped as shown.

76,876.—WINDOW SASH HOLDER.—Edward Andrews, Pottsville, Pa.

I claim the arrangement and combination of the rack, C, box, A, latch, B, and spring, J, operating in the manner and for the purpose herein described and specified.

76,877.—SLEIGH.—Alonzo Armstrong and Alexander Weller, Buffalo, N. Y.

We claim the combination of the curved reach, H, with the pendent links, hangers and elevated standards for supporting the sleigh body upon the rear bob.

76,878.—STEAM SAFETY VALVE.—E. H. Ashcroft, Lynn, Mass.

I claim the valve seat, E, with its elbow orifices, h, in combination with valve cover, D, rod, c, and spring, E, or its equivalent, arranged, constructed, and operated in the manner as shown and described and for the purpose set forth.

76,879.—CHURN.—David D. Baker (assignor to himself and Harvey Campbell), West Alexandria, Ohio.

I claim the combination of wings, 1 2 3 4, and vanes, a b c d, with the canopy, D, rod, B, and lever, C, the parts being constructed, arranged and operating conjointly, in the manner and for the purpose specified.

76,880.—APPARATUS FOR CARBURETING AIR.—J. F. Barker, Springfield, Mass.

I claim, 1st, The steam pipe, a, placed within the air conduit, H, of a carburetor, or within a sufficient portion of the length of such conduit, for the purposes specified substantially as set forth.

2d, The arrangement, within the air space of a carburetor, of the steam pipe, a, for the purpose of directly heating the air contained within the carburetor, whether a portion of such steam pipe is immersed in the hydrocarbon for heating the same, or entirely exposed to the contained air, substantially as described.

3d, In combination with a carburetor or generator, the arrangement of independent water wheel, fan blower, and air conduit, H, the whole forming an apparatus for carbureting air, substantially as described.

76,881.—HORSE AND CATTLE POKE, ETC.—George W. Bell and George W. Fulmer, Hinckley, Ohio.

We claim the adjustable slide, C, in combination with the yoke, A, poke, B, and head, D, in the manner as and for the purpose set forth.

76,882.—STONE PAINT.—Benjamin V. Betterton, Piqua, Ohio.

I claim the compound above described, for the purposes above mentioned.

76,883.—REST FOR GRINDING HARVESTER CUTTERS.—Thomas Brett (assignor to himself and W. H. Saxton), Genoa, Ohio.

I claim the adjustable standard, B, and wheel, F, as arranged in combination with the jaws, A, for the purpose and in the manner as described.

76,884.—CARPENTERS' GAGE.—Wessel Brodhead, Meadville, Pa.

I claim the bar, A, and the head piece, B, constructed and operated as and for the purpose set forth.

76,885.—CASTER FOR FURNITURE.—John Brown, Utica, N. Y.

I claim forming the roller of the parts, B and C, and the plate, D, substantially as described and for the uses and purposes mentioned.

76,886.—TOY BOOMERANG PISTOL.—O. B. Brown, Malden, Mass.

I claim the toy herein described, consisting of an instrument for supporting and throwing a small boomerang, constructed and operating substantially as described.

76,887.—ARTIFICIAL FUEL.—A. W. Buckland and A. M. Daniels, Hartford, Conn.

We claim an artificial fuel made from the materials, in the proportions and in the manner substantially as above described.

76,888.—BRICK MACHINE.—E. P. H. Capron, Springfield, O., assignor to himself, George H. Gerrish and D. D. Rich.

I claim, 1st, Securing the striker plate in position, by means of the rod, i, and set screw, j, arranged to operate substantially as described.

2d, The rod, h, provided with a nut, i, and arranged to bear upon the striker plate, g, substantially as set forth.

3d, Facing the iron mold wheel, E, above described, with the detachable V-shaped steel plates, e, substantially as set forth.

4th, The incline, l, made adjustable both horizontally and vertically, for varying the pressure and pressing the brick from below, substantially as described.

5th, Providing the follower, m, with the hinged supports, p, thereon, and the springs, q, for supporting the follower clear from the track while the molds are passing under the hopper, substantially as described.

6th, The combination and arrangement of the hinged supports, p, nuts, s, and the shoulders, r', in the mold wheel, for adjusting the follower to vary the thickness of the brick, as desired.

7th, Providing the follower, m, with a friction roller, w, that can be adjusted to compensate for the wear of the rollers, or the track, or both, substantially as set forth.

8th, Securing the cloth to the plate by means of the grooves, t, and leather strips placed therein, and sewing through the leather, substantially as described.

9th, The plate, a', with beveled edges, and adjusted on the follower, m, by means of the screws, substantially as set forth.

76,889.—MANUFACTURE OF MEAT AND OTHER BISCUIT.—John Carr, of the Crescent, Clapham, and Charles Lucop, Drummond Road, England. Patented in England January 18, 1868

We claim the manufacture of meat and other biscuits by first baking such of the ingredients of the biscuit as require to be baked, then adding extract of meat or such other of the ingredients of the biscuit as would be injured by the heat of the oven, and forming the whole into biscuits by pressure or force applied to the ingredients while they are contained in molds, substantially as hereinbefore described.

76,890.—SHEET-METAL CAN.—Joseph Cartwright, South Reading, Mass, assignor to himself James Cartwright, Jr., and W. K. Lewis.

I claim a polygonal can, having but one side joint, and a groove, d (for receiving a lip turned down from the head), when said groove is made before the body is formed or bent up, substantially as described.

76,891.—SASH FASTENER.—O. Cate, Boston, Mass. Antedated April 9, 1868.

I claim a fastener for window sashes, etc., composed of an arm or arms, O, and a slide, U, when arranged and combined together, substantially as and so as to operate as described.

76,892.—TOY.—Dominico Checkeni, New York city, assignor to himself, John W. Boteler and Charles K. Sherwood, Washington, D. C.

I claim, 1st, Combining two cocks or other animals by rods, cords, wheels, or an equivalent therefor, in such manner that by operating the said rods, cords, or wheels, the said cocks or other animals will be caused to imitate the motions peculiar to such animals when fighting, substantially as herein shown and described.

2d, Connecting the heads or bodies of the birds or other animals together by means of a horse hair, or an equivalent therefor, running from one to the other, substantially as and for the purposes herein specified.

76,893.—LOW WATER INDICATOR FOR STEAM GENERATORS.—Levi H. Colburn, Chicago, Ill.

I claim a low water indicator for steam boilers, constructed, connected, and operating substantially as herein described.

76,894.—BOSOM PAD.—J. C. Cook, Buffalo, N. Y.

I claim a bosom pad, consisting of an inflatable body or sack, provided with a non-elastic covering of fibrous material, shaped to the contour and dimensions desired, substantially as herein described.

76,895.—CAM FOR CARD-STRIPPING MACHINES.—Seldon L. Crockett and Benjamin T. Mills (assignors to Benjamin T. Mills), Lowell, Mass.

We claim, 1st, The lifting and replacing cam, B, constructed as shown and described, viz, with the prominent portions indicated as 5 6 and 7, and the depression between 6 and 7, and a flange or flanges, k, to relieve and ease down the top flats, and again elevate the same, substantially in the manner and for the purpose set forth.

2d, The cam, B, provided with a flange, k, constructed as described, and operating in connection with the slide and its pin, l, as and for the purpose set forth.

76,896.—BALLAST KEEL FOR BOATS.—Henry A. Dirkes, New York city. Antedated April 7, 1868.

I claim the ballast keel, B, hung or attached to the boat by toggle joints, C, and operating or operated substantially as described.

76,897.—COMPOSITION FOR BLACKING LEATHER.—John N. Engelhardt (assignor to E. E. Hendrick and Peter Dolan), Carbondale, Pa.

I claim the ingredients in combination, substantially as described for the purpose named.

76,898.—FIRE-PROOF SAFE.—John Farrel, New York city.

I claim constructing the front casing and the door of fire-proof safes each of two or more plates of iron, with a non-conducting substance interposed between the several parts, substantially as described and for the purpose set forth.

76,899.—MACHINE FOR FORMING FIFTH WHEEL.—George Feightner, Wooster, Ohio.

I claim, 1st, The removable rings, D D, in combination with the platform, A, and adjustable cam lever, E, substantially as and for the purpose set forth.

2d, In combination with the above, the slotted brace, F, and screws, G G, when used as set forth, for the purpose of retaining the fifth wheel in place while undergoing its formation.

76,900.—WRENCH FOR CARRIAGE WHEEL.—Levi B. Fisk, Lockport, N. Y.

I claim a hand wrench combining the forks, C C, and socket, B, in a single device, when employed in connection with the hub holes, F F, the whole arranged and operating in the manner and for the purpose herein described.

76,901.—DEVICE FOR MULTIPLYING REVOLUTIONS AROUND AN AXIS.—Lemuel S. Fithian, East New York, N. Y.

I claim, 1st, The combination of the reversing wheel, R, partitioned, revolving cylinder, C, with one or more sets of multiplying and intermediate wheels, D and P, with straps, g g, when combined substantially as herein set forth.

2d, The straps, g g and g, and their equivalents, when employed to sustain and strengthen the ends of the axes on which the intermediate wheels, P P' and P'', revolve.

3d, The reversible hollow cylinder, C, by means of one or more wheels, P and b, one having an axis coincident with the axis of the shaft, and the other or others parallel therewith.

76,902.—DEVICE FOR MULTIPLYING MOTION ON A SINGLE SHAFT.—Lemuel S. Fithian, East New York, N. Y., assignor to himself, James M. Hopkins and Jefferson W. Southmayd, New York city.

I claim, 1st, The stationary lever, B, having slot and communicating wheel, b, the wheel or disk, A, and lever or wheel, A', carrying slot and communicating wheel, a, and fast upon the shaft, S S, the reverse revolving wheel or disk, D, the revolving wheels or disks, D E F, etc., carrying slotted lugs, and the communicating wheels horizontal to the shaft.

2d, The stationary lever or slot, B, and communicating horizontal wheel, b.

3d, The combination of the wheel or disk, A, and the slotted lever, A', with communicating wheel, d.

4th, The reverse revolving wheel or disk, C, geared differently.

5th, The revolving wheels or disks, D E F, and the slotted lugs carrying wheels, d e, arranged horizontal to the shaft.

76,903.—BROADCAST SEED SOWER.—F. G. Floyd and E. A. Floyd, Macomb, Ill.

We claim, 1st, The disk, A, with flanges, a, which flanges do not radiate in a direct line from the center, but whose inner ends are inclined forward in the direction of the revolution, as and for the purpose described.

2d, The shaft, B, with shoulder, b, thread, b1, and nut, b2, in combination with disk, A, as and for the purpose described.

3d, The pointed arm, C', in combination with shaft, B, as and for the purpose described.

4th, The feeding holes, D D', when arranged in relation to each other and to the disk, A, substantially as described.

5th, The bushings, d, in combination with holes, D D', as and for the purpose described.

6th, The bag, F, with open ring, f, in combination with hopper, F', and catches, G G'.

76,904.—HYDRAULIC MAINS FOR GAS WORKS.—James R. Floyd and Joseph A. Sabbaton, New York city, assignor to James R. Floyd.

We claim the combination of the main pipe (constructed with a lateral opening) with a lateral port plate (formed separately, and applied to the lateral opening of the main pipe), substantially as before set forth.

Also, the combination of the said main pipe, lateral port plate (formed separately, and applied to the lateral opening of the main pipe), and dip nozzles for the ports in the lateral port plate, substantially as before set forth.

76,905.—DINNER PAIL.—James H. Foote, Pittsfield, Mass.

I claim, 1st, One or more trays, b b', in combination with the drawer, d, and pail, e, as and for the purpose specified.

2d, One or more drink cans, c c', in combination with the drawer, d, and pail, e, as and for the purpose specified.

3d, The drawer, d, in combination with one or more trays, b b', one or more cans, c c, and the pail, e, as and for the purpose specified.

76,906.—CONVERTIBLE CARRIAGE POLE.—Francis Fowler, West Haven, Conn.

I claim the attachment of removable poles by means of the shifting rods D D, which slide either way along the metallic cross bar, A A.

76,907.—HAND TRUCK.—Joshua Garsed, Frankford, Pa.

I claim the within-described hand truck, constructed and operating substantially as specified.

76,908.—DRY GAS METER.—William Wallace Goodwin, Camden, N. J. Antedated November 5, 1867.

I claim the application, to a dry gas meter, of a device or combination of devices whereby the orifice in the plate through which the current of gas passes to or from the valves, will be either entirely closed or fully opened thereby, in accordance with the relative positions of the meter between the supply and discharge pipes, as described, the said device or combination of devices being constructed and operated in the manner herein described, or in any other manner that will produce the same effect.

76,909.—COMBINED CORNSTALK CUTTER, CULTIVATOR, ETC.—Matthew Gordon, Washington, Iowa.

I claim the cylinders, o p q, with cutters and teeth or hoes arranged upon the shaft, and operated substantially as and for the purposes herein recited.

76,910.—BOILER.—Chauncey O. Green and Robert Ham, Troy, N. Y.

We claim, 1st, In combination with a cooking stove or range, a water reservoir or boiler, B, when hinged or pivoted to or upon said stove or range-top, in manner such that the said water reservoir or boiler may be turned, revolved, or shifted thereon about its pivot center, and thereby be made to rest upon or over the differently heated parts of said stove or range top, to thereby increase or decrease, or regulate the temperature of water within said reservoir or boiler, substantially in manner as hereinbefore described and shown for the aforesaid purpose.

2d, In combination with a cooking stove or range, the arrangement of the exit passage or flue thereof, for the gases of combustion, and the said pivoted turning, or shifting water reservoir, both at one and the same end of said stove or range, in manner substantially as described, so that the escaping gases of combustion thereout shall impart heat to said water reservoir, in any one of its shifted positions on and over the stove or range top, as set forth.

3d, A cooking stove or range, having a top plate provided with pot holes, E, and a water reservoir, B, so mounted and pivoted thereon that it can be turned or shifted horizontally about its pivot center, as described, and placed over, or partly over, the said pot holes, so as to receive the greatest heat from the stove or range, and also be turned off horizontally, to leave the said pot holes exposed or open and free, to place culinary vessels therein, as set forth.

4th, In combination with a stove or range top, pot holes, E, and a water reservoir, turning or shifting about its pivot center thereon, as described, a loose and removable cover plate or hood, I, substantially as and for the purpose set forth.

5th, The manner of securing said pivoted and shifting reservoir to the stove or range top by means of the collar, h, with lug, a, and flange ring, e, with notch, b, or any equivalent device therefor, which shall hold the said reservoir upon the stove or range top so that it may turn about its pivot center, as described, and keep it securely thereon, in any one of its shifted positions on and about its pivot center, as set forth.

6th, In combination with a stove or range, and a water reservoir, moving or shifting about its pivot center thereon, as described, a friction flange or flanges, g, or any equivalent devices therefor, formed on or attached to the reservoir bottom, or to the stove or range top, as and for the purpose set forth.

76,911.—FIRE DETECTOR.—Wm. C. Grimes, Philadelphia, Pa. Antedated April 18, 1868.

I claim a series of tubes converging from several apartments of a house to one apartment, and adapted for the transmission of aeriform fluids to this center, substantially as shown and described, and for the purposes set forth.

76,912.—ROOT CUTTER.—J. Heberling and Wm. L. Heberling, Mount Pleasant, Ohio.

We claim, 1st, The knives, H, or their equivalent, substantially as described and for the purpose set forth.

2d, The oblique curved slots, e', having an offset directly beneath the forward part of the knives, F, to prevent clogging, the concave and convex sides of which curves bend or turn toward the stationary cutting knives used in connection therewith, as seen at, e', fig. 1, all strips or slices that pass through.

3d, The projecting cutters, G, or their equivalent, for the purpose specified.

4th, The combination of the projecting cutters, G, knife, F, curved slots, e', and knives, H, as shown, and for the purpose specified.

5th, Such a regular inclination of the surface of the knives and the periphery of the cylinder, from the edge of each knife to the one next in its rear, as to bring the said surface within the edge of it a sufficient distance to constitute the throat.

6th, The hollow metallic cylinder, E, having rimmed ends, one of which is open, inclined periphery, oblique curved slots, e', substantially as shown and described.

76,913.—MODE OF CHURNING BUTTER.—Isaiah Herrick, Merrimack, N. H.

I claim the dashers, E E', constructed as described, in combination with springs, O O', steps, F F', cog wheels, B B', pinion, C, standards, H H', journal box, G, shaft, A, and crank, V, arranged substantially as and for the purpose set forth.

76,914.—LEATHER POLISHING MACHINE.—J. W. Hildreth, Boston, Mass.

I claim, in a machine such as described, the combination, with the yielding bed upon which the leather is placed, of the vibratory lever to which the glassing tool holder is attached, provided at its point of suspension with an elastic and yielding bearing, substantially in the manner and for the purpose herein shown and set forth.

76,915.—FRUIT JAR AND CLAMP.—A. J. H. Hilton, Boston, Mass. Antedated March 10, 1868.

I claim the angular clamp, G, with its jaws, a a, in combination with the inclined planes, F F, of the cover, C, the rubber packing ring, and the straight shoulder, B, of the jar, A, all as specified.

76,916.—CROCHET NEEDLE.—J. M. Hoadley, Birmingham, Conn. Antedated April 8, 1868.

I claim, 1st, The holder, B, for crochet needles, formed, with the needle, A, from the same piece of tempered wire, as herein shown and described.

2d, The holder, B, for crochet needles, formed of tempered wire, upon which

the needle is arranged to slide and be held in position by the elasticity of said holder, as herein shown and described.

76,917.—FRUIT CAN.—L. E. Holden, Cleveland, Ohio.

I claim the combination of the pipe, B, tube, D, and stopper, C, as and for the purpose substantially as specified.

76,918.—GATE LATCH.—G. B. Howland, Gardner, Ill.

I claim the peculiar construction of the drop latches, and their attachment to the middle piece, b, as shown in fig. 2, thereby securing an unobstructed space immediately above the latches, so that the gate may be opened, as herein described, without necessarily involving a spring or unnecessary weight of iron, in connection with the bar or stop on the gate, either of which is more expensive and inconvenient to operate.

76,919.—FRAME FOR STRETCHING PANTS.—J. H. Hulse, Baltimore, Md. Antedated April 8, 1868.

I claim the combination of the upright, a, with a cross-supporting piece, c, with the hinged stretcher, b c, and adjustable supporting cross pieces, f d, the whole arranged as herein described and for the purpose specified.

76,920.—GATE.—H. Hunt, Delavan, Wis.

I claim, 1st, The concave convex track J, arranged for the rollers, M L, to run on its opposite sides, in combination with the straps, V, and gate, F, substantially as and for the purpose set forth.

2d, The combination of track, J, cords, R, straps, V, pulleys, S T, box, W, and gate, substantially as set forth.

76,921.—LAMP SHADE.—S. W. Huntington, Augusta, Me.

I claim a lamp shade clasp or clamp, struck up from a single piece of sheet metal, in the manner herein described, so that one end of the clasp shall be provided with a spring tongue or clamp, bent in the manner specified, for holding the shade, and the opposite end with a hook and arms for maintaining the clasp and shade in position upon the lamp chimney or globe, substantially as shown and set forth.

76,922.—BASE-BURNING STOVE.—F. H. Husted, Buffalo, N.Y.

I claim, 1st, Forming the central combustion space, f, by means of the passage, a, and deflecting plate, b, or their equivalents, substantially in the manner and for the purposes shown and described.

2d, Dividing the combustion chamber surrounding the magazine into vertical flues, by the magazine itself, of the form described, or by the hinged plates, c d, provided with operating rods, n, or equivalent, substantially in the manner and for the purpose specified.

3d, The magazine, D, provided with deflecting plate, b, and semi-annular discharge aperture, a, or equivalent, and arranged so as to form an enlarged flue, E, in front, in combination with the oven, F, arranged and operating substantially as set forth.

76,923.—FUMIGATOR.—Richard Kerr, Boston, Mass. Antedated April 14, 1868.

I claim a fumigator arranged for employment with a piston syringe, when provided with the grate, c, and the outer removable end, a, substantially as and so as to operate in the manner described.

76,924.—WASHING AND WRINGING MACHINE.—G. W. Kintz, West Henrietta, N. Y.

I claim the combined washing and wringing machine, having the conical crimping rollers, E E', standing in opposite directions to produce a crimping of the cloth, and provided with the intermediate ribs and scoops, d f, and having the wringing rollers, G H H, so arranged as to intermatch and graduate the pressure, the whole operating as described and for the purpose specified.

76,925.—BLAST GUN.—C. Kirchhof, Newark, N. J.

I claim, 1st, The combination of a sheet or plate, h, made of the material as herein described, with an apparatus for compressing air or gas, when said sheet or plate is secured hermetically to the latter, by means of an arrangement allowing a speedy removal and restoration of such sheets, in the manner and for the purpose specified.

2d, The peculiar construction and connection of the parts, b f g, of the device, for securing the sheet, as set forth.

3d, The extension, p and o, made in the manner and for the purpose specified.

76,926.—SCREEN CYLINDER FOR COTTON PICKERS.—R. Kitson, Lowell, Mass.

I claim a cylinder surface, which is more or less raised or depressed between the perforations, substantially as shown and described, and for the purpose or purposes specified.

76,927.—LIFTING JACK.—John Kohler, New York city.

I claim the lever, A, pawls, C G, and pawl disengaging pin, H, in combination with the ratchet wheel, D, pinion, E, and rack, F, substantially as and for the purposes set forth.

Also, the slot, I, and pin, i, all operating together, as shown and described to form a new and improved carriage jack.

76,928.—CHURN.—Joseph Liebhaber, Bless, Bavaria.

I claim the combination of four or more beaters of different construction, for the purpose above set forth and described.

76,929.—CONDENSER.—Wm. A. Lighthall, New York city.

I claim arranging the exhaust pipe from the engine, with its series of openings, as shown, in relation to the vacant space between the series of tubes, as and for the purpose herein set forth.

76,930.—FRAME FOR WINDOW SCREENS.—C. F. Linscott, Woburn, Mass.

I claim the clasp, B, made of sheet or cast metal, and attached to the inner corner of a frame, for the purpose of securing the sides of the frame together, substantially as set forth.

76,931.—GATE.—Frank Livingston, Marathon, N. Y.

I claim the bar, F, hinged and pivoted as described, in combination with the gate and sliding hinges, D D, for the uses and purposes set forth.

76,932.—HORSE RAKE.—S. P. Mecay, Killbourne, Ohio.

I claim, 1st, The handle, H, when pivoted to the frame, and provided with an adjustable shoulder, J, and hook, I, for the purpose of regulating the double rake head, D, as and for the purpose specified.

2d, The double rake head, D, provided with S-shaped slots, x x, in the cross heads thereof, and having spurs, m m, secured therein, in combination with handle, H, and frame, A, as and for the purpose specified.

76,933.—PUMP PISTON.—F. P. Michel, Rochester, N. Y. Antedated April 14, 1868.

I claim the construction of the hollow piston, A, with the ribs, f f, and hook, h, for the ready insertion and removal of the valves, the whole arranged and operating in the manner and for the purpose specified.

76,934.—CONSTRUCTION OF ICE PITCHER.—F. J. Miller, Brooklyn, N. Y. Antedated April 10, 1868.

I claim an ice pitcher, having the walls, c a, and bottoms, d b, and lower rim or base, e, constructed substantially as shown and for the purpose set forth.

76,935.—METHOD OF PREPARING LAUNDRY BLUEING.—E. L. Molineux, New York city.

I claim, 1st, Forming the article called laundry blueing into sticks or fingers, and thus preparing it for sale and use, substantially as described.

2d, Combining laundry bluing with starch, sugar, or other soluble glutinous or saccharine substance, thereby diluting it and improving it for use, whether the same be formed into sticks or fingers or not.

76,936.—MACHINE FOR CUTTING BUNGS.—James H. Murrill (assignor to himself, Lewis R. Keizer, and Jacob Seeger), Baltimore, Md.

I claim, 1st, The arrangement of the collar, with ith its spring feeders, G G, that lie in the slots of the cylinder, E, and are operated to carry the stick through the cylinder after being rounded by the cutters, substantially as specified.

2d, The wheel, K, provided with the slides, a a, and placed on the end of the cylinder, E, for griping the stick while the bung is being formed, substantially as specified.

3d, The arrangement of the sliding frame, L, with shafts, T and M, placed opposite to each other, one provided with the cutters, T and u, and the other with the saw, N, whereby the bung is formed, cut from the stick, and dropped, in the manner substantially as specified.

4th, The arrangement of the adjustable rod, Q', supported by the bars, f l, and in combination with the inclined bar, R, on the end of frame, L, whereby the bung is held and dropped, the whole arranged to operate substantially as specified.

76,937.—SPINDLE BOLSTER.—G. H. Noble (assignor to himself and B. T. Mills), Lowell, Mass.

I claim the divided and tapering or conical bushings or linings, combined with a spindle bolster, as described, the said bolster being provided with one or more oil-passages, c, and a dishing top, to receive and convey the lubricating substance to the oil space, b, and the spindle, in the manner and for the purpose specified.

76,938.—LOCOMOTIVE COW CATCHER.—James Noble, Pittsburgh, Pa.

I claim, 1st, The construction of a locomotive cow catcher, consisting of a revolving cylinder or cylinders, with face or faces serrated or toothed, and so connected with the forward locomotive truck as to receive the motions described, and operate substantially as and for the purposes hereinbefore set forth.

2d, An apron, n, extending from some fixed part of the locomotive forward over a revolving cylindrical cow catcher, g, substantially as and for the purposes herein set forth.

76,939.—CASTING MOLD BOARD.—James Oliver, South Bend, Indiana.

I claim, 1st, A chill, provided with core seats or recesses, e e e, substantially as described and for the purpose set forth.

2d, In combination with the core seats, e e e, the chamber chill, C, substantially as described.

76,940.—SCORING GAMES.—William B. O. Peabody, Boston, Mass.

I claim, 1st, The series of changeable, differently-marked dials, in combination with the scoring and registering apparatus, as set forth.

2d, The box, A A, formed in two equal parts, and containing the duplicate sets of changeable dials and indicating apparatus, as and for the purpose specified.

76,941.—BAG FASTENER.—G. H. Peacock, Fairport, N. Y.

I claim the band, A, composed of metallic cord, in connection with the clasps, B B, and fastenings, C D, arms, E E, and ears or projections, F F and G G, all arranged to operate as herein set forth.

76,942.—RAILROAD RAIL.—L. B. Prindle, Litchfield, Mass.

I claim a continuous reversible rail, with its accompanying chair and key, constructed substantially as herein set forth and described.

76,943.—OPERATING FERRY BOAT.—E. W. Quincy and Wm. Fisher, Lacon, Ill.

We claim a ferry, or other boat, provided with flanged drums, a a', arranged with reference to the prevention of the abrasion of the parts of the draft rope upon each other, in the manner described.

76,944.—LIFTING APPARATUS.—Frank W. Reilly (assignor to himself, George F. Root, Ebenezer T. Root, and Chauncey M. Cady), Chicago, Ill.

I claim a lifting apparatus, constructed substantially as described, consisting of two adjustable vertical rods, projecting above a table on which the patient stands, connected with suitable mechanism beneath the table for carrying the weights used.

76,945.—LAMP BURNER.—F. S. Robinson, Boston, Mass.

I claim, 1st, In combination with the deflector, G, the spring points, e, for the purpose of supporting the deflector by entering grooves or recesses in the chimney prepared to receive them, as described.

2d, Confining the chimney and centering it by means of centripetal holders, constructed and operating as set forth.

3d, The combination and arrangement of the slide, J, levers, K L, sliding holders, M, and springs, N, in the manner and for the purpose specified.

76,946.—BRICK KILN.—Robert Robson, Buffalo, N. Y.

I claim, 1st, The combination and arrangement of a series of kilns, A B C, etc., with a central area, G, and passage way or ways, H I, for supplying and removing the bricks and tile, substantially in the manner set forth.

2d, The furnaces, n, bridge wall, p, and connecting flue, J, and chimneys, S, arranged substantially as herein described.

76,947.—CIRCULAR SAW TABLE.—George H. Sanborn, Boston, Mass.

I claim the spring bar, L, in combination with the grooved slats, K, arranged and operating as described.

76,948.—WATER VESSEL FOR FIRE-PROOF SAFE.—R. S. Sanborn, Ripon, Wis.

I claim a water vessel for steam fire-proof safes, suspended to the wall of the safe, substantially in the manner and for the purpose specified.

76,949.—PEG CUTTER.—D. B. Sanderson, Lewiston, Me.

I claim the arrangement of the tongue, f, plate, d, arm, b, and helix, k, in the manner herein illustrated and described, upon and in combination with the curved stock, a, as and for the purposes set forth.

76,950.—SEWING MACHINE.—A. H. Sherwood, Southport, Conn. Antedated April 16, 1868.

I claim the combination of disk, J, pin, L, with the shuttle-carrying arm, D', and rocking arm, B, provided with curved slots, N M, the whole operating substantially as and for the purpose set forth.

76,951.—MACHINE FOR ROUNDING THE CORNERS OF SLATE FRAMES.—Edward Snyder (assignor to himself and Morgan Jones), Slatington, Pa.

I claim the curved guides, d1 d2, and pins, a1 a2, or their equivalent, arranged and operating relatively to the cutter, C, and carrier, D, substantially as and for the purposes herein set forth.

76,952.—TEETH FOR HAY SPREADERS.—George A. Squier, Syracuse, N. Y.

I claim the fork head, A, made in sections, A a, for securing the tines, and having serrated joints, f, as herein shown and for the purpose described.

76,953.—MACHINE FOR HARVESTING POTATOES.—O. S. St. John and T. C. St. John, Willoughby, Ohio.

We claim, 1st, The use of the elongated flat knife or blade, J, and straps, R R, constructed substantially as described, located and operating in the especial manner herein set forth and for the purpose stated.

2d, The employment of the detachable drag separator herein described, having the two outer arms rigid and the intermediate ones vibratory, so as operate in the manner described, and in connection with the said knife, J, as and for the purpose set forth.

3d, The special use and employment of the extra attachment herein described, constructed and operating substantially as and for the purpose stated.

4th, The combination of the said drag separator and the said extra attachment, operating in the manner and for the purposes set forth.

5th, The plows, K and K', in combination with the broad knife, J, operating as and for the purpose herein stated.

6th, The levers, A A', connecting rods, B B', forked rods, C C', plow standards, D D', rods, E E', guide plates, F F', provided with catch holes, G G', swing bar, H, and pawls, I I', in combination with the knife, J, or with the extra attachment, drag separator and plows, K K', all constructed and operating substantially in the manner and for the purposes herein set forth.

76,954.—HAY HOISTING DRUM AND GRAIN FORK.—Henry Strickler, Borough of Carlisle, Pa.

I claim the extension, f, of the lower ratchet, f', operating with the arm, h, and the pulley, w, and the rope, w', for the purpose of enabling the person working the hook or fork on the loaded wagon therefrom to unshift the drum.

2d, The beveled cog wheel, m, fastened on the upper outer face of the drum, g, the beveled cog wheel, n, the arm, o, the spur cog wheel, p, the spur cog wheel, q, the arm, r, the arm, s, the fork, u, and the inclined plane, v, all combined and operating in the manner and for the purpose herein set forth.

76,955.—MACHINE FOR MAKING AUGER BITS.—James Swan, Seymour, Conn.

I claim, 1st, The holding jaws, J J', attached to the sliding plate, I, in combination with the slides, G G' G'', provided with the dies, c f h, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

2d, The combination of the holder, J J', constructed as described, in combination with the operating parts thereof, as herein shown and described.

76,956.—AUGER HANDLE.—James Swan, Seymour, Conn.

I claim the cylindrical key, C, within the handle, A B, provided at its front end with the V-shaped groove, g, and upon its under side with the longitudinal groove, e', fitting over the lug, f, in the socket, a, and having at its rear end the circumferential groove, d, fitting over the lugs, b, upon the part B of the handle, all constructed and operating as described, whereby as the parts A B are screwed together, the key, C, is operated longitudinally, to clamp the shank of the auger, as herein set forth and represented.

76,957.—PROCESS FOR TANNING.—Dexter Symonds, Marlow, N. H.

I claim, 1st, The process substantially as described of producing or obtaining from bark or other substances liquid for tanning hides and skins.

2d, The application of such liquid to hides or skins to be tanned.

3d, The liquid herein described as a new production for tanning purposes, when produced or obtained by the process described.

76,958.—DIE FOR MAKING CLOCK COLLETS.—Hiram C. Thompson, Bristol, Conn.

I claim the combination and arrangement of the dies, E e, gage pin, F, and back gage, G, arranged and operating on the base plate, substantially as described.

76,959.—SHIFTING RAIL FOR CARRIAGE SEATS.—Samuel Toomey, Wilmot, Ohio.

I claim the projection, G, on the inner side of the bracket, a, at the inner edge of the mortise, in combination with the gib, C, and wedge, d, substantially as and for the purpose herein specified.

Also, in combination with the gib and wedge fastening at the front, the square hook tenons, g g, and shoulder, f, bearing with a spring pressure upon the brackets, b b, substantially as and for the purpose herein set forth.

76,960.—INSULATOR FOR TELEGRAPHS.—Cromwell Fleetwood Varley, New York city.

I claim, 1st, The use of petroleum or paraffine oil, coal tar naphtha, or paraffine wax, for renovating the insulating power of surfaces rendered defective by age, exposure or other cause, as set forth.

2d, The use of the above named materials for increasing the insulating power of porous or otherwise imperfect insulators, as set forth.

76,961.—FEED WATER HEATERS FOR BOILERS.—Charles Webster, New Haven, Vt.

I claim an apparatus for heating the feed water of a steam generator, combining the following elements, viz., a tank, B, and a system of pipes connecting it with a heater, G, so arranged that the latter may be adjusted in its position in the fire box, substantially as set forth.

76,962.—TRAVELING BAG.—Charles A. Wellington, East Lexington, Mass.

I claim in combination with the jaws, b c, the hooks, d, each hinged at one end to the jaw, b, and having at its opposite end the bend, f, and tooth, g, the tooth entering the socket or recess in the jaw, c, to confine the jaws together substantially as described.

Also, the stationary staples or eyes, l, riveted to the metal jaw frame, substantially as described.

76,963.—GATE.—Geo. W. Winterringer, Fredericktown, O.

I claim the combination and arrangement of the beveled angles, E and F, of the box, G, and slotted shaft, D, operated by the forked or straight lever, G', substantially as and for the purposes herein described and set forth.

2d, In combination with the above, the springs, m, or their equivalent, the flattened and oblong head of the bolt, b, the operating lever, G', all arranged and operated substantially as and for the purposes herein described and set forth.

3d, In combination with the above, the weight, H, arranged and operating as described, for the purpose of closing the gate, as specified.

76,964.—CORN PLOW.—Joseph Wolf, Young America, Ill.

I claim, 1st, connecting the forward ends of the beams, C C, to the axle, A, by means of metallic loops, so that said ends can be shifted, while the rear ends can be adjusted, substantially as and for the purpose set forth.

2d, The arrangement of the axle, A, with the beams, C C, which are loose at their rear ends, and with the tongue, F, as and for the purpose set forth.

3d, The arrangement of the draft bars, H H, with the axle, A, and tongue, F, as and for the purpose set forth.

76,965.—ELECTRO-MAGNETIC VALVE GEAR.—Edwin A. Wood, Utica, N. Y.

I claim, 1st, The use of the electro-magnet, one or more, for connecting and detaching the cut off, or governor valve or valves of a steam engine, with and from the power which operates such valve or valves, as described.

2d, The use of the governor and electro-magnet, one or more, in combination with the inlet cut-off or governor valve or valves of an engine, for the uses and purposes mentioned.

76,966.—LAMP BURNER.—John R. Ackerman, Edward B. Campbell and Niram O. Golden, Dobb's Ferry, N. Y.

We claim the arrangement of the perforated cylinder, D, with relation to the open-bottomed cone, C, conical top, E, and wick tube, A, as herein described for the purpose specified.

76,967.—LIFTING JACK.—G. H. Alger, Ames, N. Y.

I claim the arrangement of the uprights, C, rack, B, base, D, cross pieces, G G', lever, A, link, g e, lever catch, b, and lifting toe, E, all constructed and operating together substantially as and for the purpose as shown and described.

76,968.—BED BOTTOM.—John Allen, Pughtown, Pa.

I claim the bed bottom constructed of inelastic bands or strips, jointed together in thines, crossing each other in the middle, as shown, being supported by rings upon the rails of the bedstead, and stretched sidewise by the bands, 1 2, 3 4, and 7, the whole constructed in the manner and for the purpose above set forth and described.

76,969.—MODE OF HANGING RECIPROCATING SAWS IN SAW-MILLS.—Emanuel Andrews, Williamsport, Pa.

I claim hanging reciprocating saws, so that the strain may be adjusted to any desired part by hooks and stirrups, with circular lips, when made and arranged substantially as and for the purpose set forth.

76,970.—EGG BEATER.—Wm N. Angus, Morristown, N. J.

I claim the screw or spiral threaded shafts, A and L, cog wheels, I and J, and the nut, D, in combination with an egg beater, constructed, arranged and operating substantially as described and for the purpose set forth.

76,971.—CORN PLANTER.—Aaron Armstrong, Gillespie, Ill.

I claim the foot lever, F, connected or applied to the draft pole, B, to operate in the manner substantially as and for the purpose set forth.

76,972.—MILLSTONE EXHAUST.—David Baird, Bloody Run, Pa.

I claim, 1st, In an exhaust for millstones, the separator, I, when constructed with horizontal interlocking shelves, I I', arranged substantially as and for the purpose set forth.

2d, Collecting the condensed moisture that may be deposited in the exhaust, or in any of the air chambers or passages, by means of a set of cups or receivers, m m, n n.

76,973.—RAILWAY SWITCH.—A. F. Ballas, Pottstown, Pa.

I claim, 1st, The switch tongues constructed as described, with their points lower than the tread of the rails, A B, and adapted to fit against the web and below the tread of said rails, free from contact with the tread of the car-wheel, as herein described, for the purpose specified.

2d, In combination with the above, the counter weight, constructed and arranged to operate as herein described, for the purpose specified.

3d, In combination with the tongues, C, and counter weight, F, the revolving target, F, and gearing, O, operating substantially as described for the purpose specified.

76,974.—PURIFYING OIL AND FAT.—Richard C. Barton, Brooklyn, N. Y.

I claim, 1st, Purifying fat and oils, and decomposing them, to separate them from impurities and from gelatinous matter, by means of ferment or protein, as set forth.

2d, The process herein shown and described of treating oils and fats for purification, and for separating impurities.

3d, The process herein shown and described of treating stearic acids.

4th, The apparatus herein shown and described, consisting of the tanks, A and B, and of the agitator, C, all made as set forth, for the purpose of treating fats and oils in the manner specified.

76,975.—HORSESHOE MACHINE.—Hazen J. Batchelder and Geo. E. Woods, Marlboro, Mass.

We claim the combination and arrangement of the recess, b, with the carriage, B, bender, A, and rollers, E E, formed and arranged substantially in the manner and so as to operate as described.

Also, the combination and arrangement of the cutting shears, n, o, the stop gage, p, the bender, A, and rollers, E E, and the discharging recess, b, the whole being to operate as set forth.

Also, The combination as well as the arrangement of the auxiliary nail hole punch, u, and its operative lever, y, with the bed, s, and the main nail hole punch, r, and its operative lever, G.

Also, the combination of the gage, t, the bed, s, the creasing punch, and the lever, G.

Also, the combination of the cammed lever, w, with the one or more punches, arranged to operate with a bed, s, in manner as described.

76,976.—BEEHIVE.—Edgar B. Beach, West Meriden, Conn.

I claim the combination of the outer case, C, with the inner case, A, when the inner case is provided with a frame case, E, and so as to be removed from the case, A, and so as to be closed by the outer case, C, substantially as and for the purpose specified.

76,977.—SUSPENDER FOR STOVE HANDLE, ETC.—Sewell G. Thayer, administrator of the estate of Daniel N. Beard, deceased, Cleveland, Ohio.

I claim the wheel, B, when provided with guide, g, the swivel screw, C, spring, D, and cord, E as and for the purposes specified.

76,978.—WHIFFLETREE HOOK.—Francis W. Beckwith (assignor to himself and Smith, Clark & Co.), Westmoreland, N. Y.

I claim the circular spring bars, a, held against the end of the thimble by the bead, g, and the tongue, h, having the projection, l, pivoted between the lugs, m, all constructed, arranged and operating as described, whereby the spring is compressed at each outward and inward movement of the tongue, and the latter held either open or closed by the outward expansion of said spring, as herein described for the purpose specified.

76,979.—LAMP BURNER.—G. A. Beidler, Philadelphia, Pa.

I claim, 1st, The rarefying conductor, B, made substantially as shown and described.

2d, In combination with the rarefying conductor, B, the conical deflector, A, substantially as shown and described.

76,980.—HAY FORK.—Henry F. Bemendefer and Dwight H. Finch, Attica, Ohio.

We claim the fork, A, with the shank, B, arranged with the catch bar, D, and handle, E, the parts being constructed and operating as and for the purpose set forth.

76,981.—WINDOW SASH LOCK.—W. H. Betts, Brooklyn, N.Y.

I claim the divided under cut or dove tail slide, b c, in combination with the sliding locking piece, b, the parts being constructed and applied substantially as set forth, to form a sash fastener.

76,982.—FEATHER DRESSING MACHINE.—Samuel W. Bevans (assignor to himself and George A. Munson), Plymouth, Conn.

I claim in a feather dressing machine attaching a discharge tube in or near the center of the bilge or cylinder, substantially as and for the purpose described.

76,983.—DEVICE FOR TURNING NUTS.—Byron Boardman (assignor to himself and Frank Douglas), Norwich, Conn.

I claim, 1st, The adjustable ring, A, with projections, B B B B, when used for the purpose specified.

2d, The combination of the arbor, C, with ring, A, substantially as herein specified.

76,984.—THILL COUPLING.—C. S. Bonney, Penn Yann, N. Y.

I claim, 1st, The construction and arrangement of the parts, A and D, screw, E, when made and used as and for the purpose set forth.

2d, The part, B, with the channel, H, to prevent the screw E, from turning when made and applied to the part A, substantially as herein specified.

76,985.—TUBE WELL.—Adam S. Brown, Lebanon, Pa.

I claim, 1st, The outer wall or casing, C, of a tube well, constructed of twisted wire cables, g, arranged, secured and braced substantially as described.

2d, One or more annular perforated and flaring enlargements upon the inner tube, A, substantially as described.

3d, The rings or shields, h, in combination with a tube, A, which is constructed with annular perforated enlargements, and with an outer perforated or open work casing, C, substantially as described.

76,986.—SEWING MACHINE.—Charles E. Brown, East Randolph, Mass.

I claim the guide bar, F, provided with a slot, g, and pin, h, in combination with the collar, K, bolt, d, and the spring, R, when constructed and used substantially as and for the purpose herein set forth.

76,987.—TICKET HOLDER.—Smith M. Brown and Harvey J. Brown, Holly, Mich.

I claim the ticket holder constructed as described, consisting of the plate, A, having its sides, a a, and lower end, b, bent in toward and parallel with the face of the plate, whereby a channel is formed between said sides and plate for the passage of the ticket, which is clamped therein by the lip c, said holder adapted to be secured to the ends of a hat band by means of the rings, C C, held in the plate, A, by the bent slides, a, all arranged as herein described for the purpose specified.

76,988.—POCKET BOOK AND FAN COMBINED.—Otto Bruck, New York city.

I claim a fan and pocket book combined, as a new article of manufacture.

76,989.—QUARTZ CRUSHER.—Andrew Buchanan, Brooklyn, N. Y.

I claim, 1st, The connecting straps, F, in combination with the crushing jaws, E G, substantially as and for the purpose described.

2d, The rockers, H, in combination with the jaws, E G, constructed and operating substantially as and for the purpose described.

3d, The balance springs, J, in combination with the jaws, G, constructed and operating substantially as and for the purpose set forth.

76,990.—CLOTHES DRYER.—David M. Buckley, Athens, O.

I claim a clothes dryer constructed with a shaft, B, cords, D and E, and parallel bars, F F', arranged substantially as described.

76,991.—FERTILIZER.—W. G. Busey, Georgetown, D. C.

I claim the fertilizer formed by the combination and manner of combination of the several specific materials, substantially as herein set forth.

76,992.—STEAM SAFETY VALVE.—Albert G. Buzby, Philadelphia, Pa.

I claim the two valves, B and B', the former being connected to but loaded independently of the valve, B', when the said valves are contained within a casing, substantially as and for the purpose herein set forth.

76,993.—PRINTING TELEGRAPH.—Edward A. Calahan, Brooklyn, N. Y., assignor to the Gold and Stock Telegraph Co., New York city.

I claim, 1st, A magnet for giving or controlling the impression, placed in a main electrical circuit, that is separated from the circuit that controls the type wheel or denoting device, so that the impression can be made independently of any other operation, when the type wheel or denoting device has been properly moved, substantially as set forth.

2d, Two or more type wheels, separately controlled by magnetism, and arranged side by side, or with their axes on the same line, so as to be impressed jointly or separately, on one strip of paper, substantially as and for the purposes set forth.

3d, The combination of the type wheels, k and l, magnets, f and i, with the magnet, e, and impression roller, u, or its equivalent, substantially as and for the purposes set forth.

4th, The reverse ratchet wheel, q, and pawl arm, r, in combination with the ratchet wheel, p, and pawl, 5, for moving and holding the type or character wheel, substantially as set forth.

76,994.—BOTTLE STOPPER.—Sheldon Cary and Spencer C Cary, New York city.

We claim as a new article of manufacture, a bottle stopper provided with a cap, B, of metallic foil, and a flat plate, C, which projects over the edges of the stopper, whereby said stopper is prevented from being forced too far into the neck of the bottle, as described.

76,995.—NUT FASTENER.—James Christy, Philadelphia, Pa. Antedated April 14, 1868.

I claim the wire, D, bent, secured, and applied to a nut, or to a bolt or screw head, substantially as and for the purpose described.

76,996.—AUTOMATIC FLY BRUSH AND FAN.—Elijah J. Clark, Kalamazoo, Mich.

I claim the arrangement of the shaft h, cam, l, and looped rod, F, in combination with the shaft, J, rods, f f, and fans, H H, all constructed and operated as and for the purposes set forth.

76,997.—SPOOL STAND.—Nicholas P. Clarke (assignor to himself and Chas. E. Griffin), Central Falls, R. I.

I claim the spool stand constructed as described, consisting of the revolving spool carrying plate, C, provided with upturned radial arms, a b, having tubes, c, the fixed right-angular plate, F Fx, pivoted knife, G, and operating spring arm, H, all arranged and operating as described and for the purpose specified.

76,998.—APPARATUS FOR RELIEVING CHOKED ANIMALS.—George Clump, Hamden, assignor to himself and Wm. Enerle, New Haven, Conn.

I claim the herein described apparatus, consisting of the tube, A, provided at one end with the mouth, B, or bulb, C, or with one at each end of the tube,

so as to operate substantially in the manner and for the purpose herein described.

76,999.—BEEHIVE.—A. F. Cobb, Chapel Hill, Mo.

I claim a beehive constructed of metal and having its inner surface coated with plaster of Paris and beeswax, substantially in the manner and for the purpose herein described.

77,000.—TUBE WELL.—Charles H. Colby, Lynn, Mass.

I claim a tubular well with strainers set in screw disks or plugs, the perforations flaring inwardly, all constructed and applied as herein set forth.

77,001.—BILLIARD AND DINING TABLE.—Hugh W. Collender, New York city.

I claim, 1st, The elevating mechanism, substantially such as herein described, in combination with a billiard table bed which is convertible, so that it can be used for playing billiards or for dining or other uses, as described.

2d, The combination of the elevating mechanism, the movable or outer bed frame, d, and the reversible bed, m, substantially as and for the purpose described.

3d, The combination of the elevating mechanism, the outer or bed frame, d, the bed, m, or the equivalent thereof, and the adjustable pieces, e, of the legs, substantially as and for the purpose described.

5th, The combination of the spirit levels with the angle sight plates, substantially as and for the purpose described.

77,002.—METHOD OF TIGHTENING TIRES.—S. W. Corbin (assignor to himself and J. B. Sands), Vallonia Springs, N. Y.

I claim, 1st, Tightening the tire, having one end secured in the fellies by means of the block, C, formed upon the opposite end of the tire, having an inclined side, J, the rebated slot, E, in the felly, the T-shaped block, F, block G, and plate, D, all constructed, arranged, and operating as herein shown and described.

2d, The slot, E, and blocks F, and G, and plate or strap, D, substantially as and for the purposes set forth.

77,003.—VENTILATOR.—W. O. Crawford, North Star, Pa.

I claim the arrangement within the portable case, A, of the bellows, C C, being opposite to each other within said case, and surrounded by the pipes, D E, said bellows being operated from the central clock work by means of the pitmen, f f, as herein described, for the purpose specified.

77,004.—CHEESE TURNING COVER.—Q. C. Culley, Ashtabula, Ohio.

I claim the cover, A, provided with a rim or flange, B, projecting from each side, in the manner as and for the purpose specified.

77,005.—SHUTTER FASTENING.—Amos Cutter, Chelsea, Mass.

I claim the arrangement upon the side of the lower bar of a blind, of arms, a a', jaws, m m, spring, d, pivot, b, staple, g, and hole, f, for a blind catch, in combination with the two horizontal spikes, c, one driven into the wall of the house and the other into the window sill, so that said catch shall operate to hold the blind, when either open or closed, by one set of jaws, in the manner herein set forth.

77,006.—TENDER FOR HEATING AND DELIVERING METAL BARS.—S. A. Darrach, Newburg, N. Y.

I claim, 1st, The arrangement of a revolving furnace, A, provided with holes, b, in its sides, and covered with a bonnet, D, in combination with the mechanism described for introducing and removing the bars, substantially as and for the purpose described.

2d, The devices herein described for giving to the feed box, I, containing the blanks, a transverse shaking motion, substantially as and for the purpose set forth.

3d, The latches, s t, and pins, s' t', in combination with the jaws, o, wedge, r', slides, p r, and revolving firepot, C, all constructed and operating in the manner and for the purpose herein shown and described.

77,007.—VENTILATOR FOR HATS.—Geo. Deas, New York city.

I claim a ventilator for hats formed of the elastic adjustable bands, B and E, connected together by springs, with an open space between them, each being adjustable, the outer one to the size and shape of the hat, and the inner one to the size and shape of the head, substantially as herein shown and described.

77,008.—MUCILAGE BOTTLE.—David Wm. De Forrest, Brooklyn, N. Y.

I claim the shape of the mouth and neck of the bottle, in combination with the bulge forming the shoulder, substantially in the manner and for the purposes as herein described.

77,009.—SEEDING MACHINE.—C. Deis, Canal Dover, Ohio.

I claim, 1st, The combination and arrangement of the rollers, B, foot, A', and share, B', in the manner as and for the purpose specified.

2d, The slides, H H', in combination with the box, C, when operated in the manner and for the purpose substantially as set forth.

77,010.—TOBACCO HAND TYING MACHINE.—David C. Dellinger, Russellville, Ohio.

I claim, 1st, The cylinder, A, having the slot, s, and the expanded end, in combination with the bed, E, and the guard, T, substantially as and for the purpose specified.

2d, The fork, B, when used in connection with a rotating cylinder, A, substantially as and for the purposes set forth.

3d, The block, G, when used in combination with a revolving cylinder, and when provided with a lever and spring, or their equivalents, by which it can be raised or lowered, substantially as and for the purposes set forth.

4th, The combination of the cylinder, A, gear wheels, a I, cord, u, weight, C, and treadle, M, substantially as and for the purposes specified.

5th, The hook, Q, in combination with the cylinder, A, substantially as and for the purposes specified.

77,011.—MACHINE FOR PREPARING WOOL, COTTON, ETC.—Alex. J. Deru, Henry, Belgium, assignor to Simon Delize, Providence, R.I.

I claim, 1st, The combination of the case or hopper, A, with endless apron C, and adjustable partition, x, as and for the purpose set forth.

2d, The combination of the two cylinders, D and B, with the case and endless apron, C, arranged substantially as herein described and for the purpose set forth.

3d, The combination of the two brush cylinders, 1 and 2, the two reservoirs, O and c, and plate, Q, substantially as described and for the purpose set forth.

4th, The combination of the oiling apparatus, constructed as described, with the cylinders D and B, substantially as specified.

5th, In combination, the wool delivering or feeding mechanism, the oiling mechanism, the pressing and the bat or lap-forming mechanism, substantially as described and for the purpose set forth.

77,012.—MATERIAL FOR JOURNAL BOXES.—Patrick S. Devlan, Hudson City, N. J.

I claim, 1st, Forming the anti-friction material for lining journal boxes of the ingredients, in the manner, and by the means herein described, and cutting the same by dies or with punches into the required shape, as set forth.

2d, The lining for journal boxes composed of fibrous material impregnated with pulverized plumbago, soapstone, or other earthy matter fixed with a strong size, and rolled and cut by dies or punching into the required shape, substantially as herein shown and described.

77,013.—WOOD PLANING MACHINE.—Frank Douglas, Norwich, Conn.

I claim, 1st, Supporting the feed rollers, C C', upon a vibrating beam, D, which itself is supported by a sliding standard that permits it to be adjusted higher or lower, when constructed to operate substantially as and for the purpose described.

3d, The combination with the sliding standard, E, of the screw shaft, H, having the collar, or its equivalent, J, and operating in connection with the ring, K, lever, L, or its equivalent, and bevel gear, b, all constructed to operate substantially as and for the purpose specified.

3d, The pivoted arm, o4, when applied to the spur gearing, n n1 m m', and operating in connection with said gearing and with the arms, o o1 o2 o3, constructed to operate substantially as and for the purpose described.

4th, The removable bearing, r, when used in connection with the arms, o o1, in an adjustable gear, substantially as and for the purpose specified.

77,014.—MEAT CUTTER.—A. J. Eddy, New Britain, Conn.

I claim the shape and spiral arrangement of the shear cutters, q, arranged interchangably upon the shafts, k, in combination with the feeders, n n, arranged within a smooth inner surface case, with the gears, o'', substantially as and for the purpose described.

77,015.—HORSE POWER.—Rollin S. Eddy, La Crosse, Wis., assignor to himself, W. H. Smith, Seth Dean, and Henry Merrill.

I claim, 1st, In a horse power, the bevel wheels, h h' and n n', or their equivalents, when constructed and arranged as described, for the purpose of distributing and equalizing the strain throughout the gearing.

2d, The pin, m, and collars, l, or their equivalents, when constructed and arranged substantially as herein described and for the purpose set forth.

3d, The wheels, h h' and n n', arranged as herein described, on a shaft, H, and held in place by a collar on the shaft, in combination with the shaft or with a master wheel, N, in a horse power, substantially as described and for the purpose set forth.

4th, The use of a device for equalizing the strain in horse powers, consisting of two bevel wheels, h h', or their equivalents, arranged to run loose on a shaft, H, and in the same direction, and to mesh into two other corresponding bevel wheels, n n', or their equivalent, running loose on a pin, M, at right angles with the shaft, H, and attached to it, as shown in figs. 2, 3, and 6, or to bearings on a wheel, N, turning about a shaft, L, as shown in figs. 4 and 5, the whole being held in place by collars on said shafts, or their equivalents, and constructed and arranged to operate substantially as described.

77,016.—CARTRIDGE BOX.—John Elbertson, Kirksville, Mo.

I claim, 1st, the self-adjusting disk, F, for holding the cartridges of caps, when used in combination with an inclosing case, substantially as and for the purpose specified.

2d, The split nipples, n n, having their sides springing slightly apart, for the purpose of holding the caps, in the manner described.

77,017.—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—Walter Elmenhorst and Franz O. Matthiessen, Jersey City, N. J.

We claim in a centrifugal machine of the character described, and having no upper fixed bearing, the combination with the purging cylinder, A, and rubber or elastic bearing to the shaft, B, of a removable or adjustable bearing brace or tie to said shaft, so hung or arranged as that it may readily be thrown in or out of steadying support to the cylinder while the machine is in motion, essentially as and for the purpose or purposes herein set forth.

77,018.—DOVETAIL MARKER.—John Evans (assignor to himself and Thomas B. Smith), Philadelphia, Pa.

I claim, 1st, The within described instrument, consisting of the frame, A, with its marking edges, x and x', and the slide, B, with its marking edges, y and y', the whole being constructed, arranged, and operating substantially as and for the purpose herein set forth.

2d, The combination of the above with the adjustable plate, d.

77,019.—EXTENSION FIXTURE FOR CHANDELIERS.—John A. Evarts (assignor to Bradley & Hubbard), West Meriden, Conn.

I claim, 1st, The socket, B, combined with the lever, E, and shoe, C, and constructed so as to operate substantially in the manner herein set forth.

2d, In combination with the above, the adjusting box, F, to adjust the friction, substantially as and for the purpose set forth.

77,020.—MILK CAN COVER.—John Fandel, Boston, Mass.

I claim the combination with a milk or other can, of the hinged cover, B, the spring, S, and packing, b, substantially as and for the purpose specified.

77,021.—OIL OR POLISH FOR LEATHER.—Samuel M. Farnham, Tully, N. Y.

I claim a composition compounded from glycerin, resinous and other substances, substantially as and for the purpose set forth.

77,022.—METALLIC BASE AND MOLDING FOR HEATING PURPOSES.—Charles E. Finkle (assignor to himself and R. O. Glover), New York city.

I claim a metallic base of metallic molding for dwellings or public buildings, when constructed and used substantially as herein shown and described for the purposes specified.

77,023.—CARRIAGE SEAT.—H. H. Forbes and H. C. Sears, New Bedford, Mass.

We claim in combination with the seat of a carriage, the pivoted, crossed, and clamped legs, arranged to operate substantially as and for the purpose described.

77,024.—DITCHING MACHINE.—E. L. Foreman, Rantoul, Ill.

I claim the platform, C, in combination with the lever, F, and sides, A and B, when arranged and used as and for the purpose specified.

77,025.—METHOD OF FINISHING LEATHER.—Lawrence B. Fox, Williamsport, Pa.

I claim, 1st, The plane stock for finishing leather, with its two sleeks and circular knife, as described and shown.

2d, In combination with the plane stock as described, the adjustable table, constructed and operated as shown, and for the purposes set forth.

3d, The combination and arrangement of the several parts composing my finisher, when used for the purposes already stated.

77,026.—MANUFACTURE OF TABLE FORKS.—James D. Frary, New Britain, Conn.

I claim the fork, A, punched or cut entire from sheet steel, substantially as described, as an article of manufacture.

77,027.—HYDRANT.—Benj. G. Fuller, Baltimore, Md.

I claim the combination with the air chamber and the piston cylinder of the hydrant, of the valve and herein described valve mechanism, operated by but not attached to the piston head, and held within a tube or case, constructed and connected with the said air and piston cylinders and chambers, in the manner and for the purposes shown and specified.

77,028.—WATCH KEY.—Henry Ganney, Louisville, Ky.

I claim the combination of the head piece, D, with its spring, E, spindle, A, having one or more studs, C, substantially as and for the purpose described.

77,029.—SHOE LACER.—D. A. Gilbert, Morrisville, Vt.

I claim the lacer, A, as an article of manufacture, when made with the end of its hook turned under, in the form shown and described, and used as and for the purpose herein specified.

77,030.—BUTTER TUB.—D. A. Gilbert, Morristown, Vt.

I claim the bars, B B, constructed as described, and used in combination with the cover, C, packing, a, and ridges, c c, as and for the purpose set forth.

77,031.—STEAM PLOW.—N. A. Gray, Cleveland, Ohio.

I claim, 1st, So hanging or jointing the digging apparatus to the locomotive that the said apparatus will have an independent adjustment, whereby it is rendered adjustable according to the unevenness of the ground, in the manner and by the means substantially as set forth.

2d, The stay, I, rod, H, and arm, J, arranged in relation to the digging apparatus, as and for the purpose set forth.

3d, The arm, J, cross head, K, spades or picks, L M, and keys, R, arranged in the manner and for the purpose substantially as specified.

4th, The construction and arrangement of the spades and picks when combined with the compound crank, and operated in the manner and for the purpose substantially as set forth.

77,032.—COAL STOVE.—C. B. Gregory, Beverly, N. J.

I claim, 1st, The combination of the outer casting, A, inner casting, C, drum, D, and the within described openings for admitting cold air to and discharging it from the space between the castings, C, and to and from the space within the drum, all as set forth.

2d, The vertical pipe, B, having a damper, g, situated between the opening, e, for admitting cold air to the space between the castings C and D) and the branch, f, through which the products of combustion pass to the said vertical pipe, as specified.

77,033.—BUCKLE.—Henry C. Griggs (assignor to Holmes, Griggs, and Smith), Waterbury, Conn.

I claim a buckle frame, constructed with the bar, B, when the said bar, B, is perforated, as at a a and E, so as to form hinging points, f f and d, and the connections, n n, so as to receive and support the tongue, F, and loop, I, in the manner substantially as herein set forth.

77,034.—CORD HOLDER.—John P. Gruger and Charles Makinson, Lancaster, Pa.

We claim the hook, A, with its jaw, a, in combination with the lever, B, with its rounded and eared head, b, both parts, A and B, connected by a pivot joint with each other, in the manner shown and for the purpose set forth.

77,035.—SCRUBBER.—V. A. Hacker, Knoxville, Tenn.

I claim, 1st, The combination of the brush, B, block, C, and sponge, D, with each other, and with the arms a2 of the handle, A, substantially as herein described, and for the purpose set forth.

2d, The perforated concave plate, E, and pivoted lever, F, in combination with the slotted handle, A, substantially as herein shown and described, and for the purpose set forth.

77,036.—MACHINE FOR BENDING WOOD.—Joseph Hale, Somerville, Mass.

I claim, 1st, In combination with the tube, d, and with the mandrel, e, when the arrangement is such that the action of the incline of said tube and the rotation of the mandrel cause a relative movement between the said parts, the entering trough, made adjustable to the diameter of the tube, and to the width of the strip being wound.

2d, The adjustable friction device, combined with the cross head carrying the inclined laced tube.

77,037.—CLOTHES PIN.—Harvey D. Haraden, Hartford, Vt.

I claim my improved clothes pin, consisting not only of the piece of wood, A, having the slit, A, the angular opening, c, and the hole, b, formed and arranged in it as described, but of the spring, d, arranged in said slit, the whole being substantially as described.

77,038.—GRATE BAR.—Andrew Hartupee, Pittsburg, Pa.

I claim, 1st, The notched cross bearers, b, of a furnace, in combination with the rib, d', of a T-shaped grate bar, of either cast or wrought iron, constructed and used substantially as and for the purpose set forth.

2d, A T-shaped grate bar, having a series of circular apertures near to each end, substantially as hereinbefore described.

3d, A T-iron grate bar, constructed with or without apertures through it, substantially as above described, as a new article of manufacture.

77,039.—RAILROAD RAIL.—J. Henry Herman, Boston, Mass.

I claim a railroad rail, having an inclined projection on one or both sides, provided with a groove, for the purpose of guiding the car wheel up into its proper position upon the track, substantially as set forth.

77,040.—GATE AND DOOR LATCH.—Charles C. Holcomb, Madison, Wis.

I claim constructing the pivoted ends of each latch with a shell or cup, which, when put together, inclose a coil spring operating upon the latches all together, being suspended by a screw or other device, passing through the centre of the cup and spring and into the gate or door, operating and constructed substantially as described.

77,041.—WASHING MACHINE.—George G. Hood, and John D. Kelley, Providence, R. I.

We claim the curved frame, C, carrying the corrogated rollers, G, when provided with the guide pins, fitting into the spiral springs, D, in the four corners of the box, in combination with the tub, A, tapering block, I, plate, H, drum, E, and shaft, F, as herein shown and described.

77,042.—METHOD OF MOLDING DESIGNS.—Leon V. Hue and Charles Roziere, Paris, France.

We claim the method of forming or impressing internal ornamentations or designs in glassware or crystal, in the manner herein shown and specified.

77,043.—HEAD REST.—H. C. Hunt, Amboy, Ill. Antedated April 10, 1868.

I claim the passenger or invalid head rest, herein shown and described, composed of the pad, A, perforated standard, B, inclined fork, C, and hooks d and e, when constructed and arranged in the manner shown and described.

77,044.—LAND ROLLER.—Edwin F. Hutchinson, Auburn, Me.

I claim the metallic heads, B B, consisting of solid metallic plates, with exterior flanges and journals, as specified, and used in combination with staves, C, connected by the bolts, z, in the manner as set forth.

77,045.—SLEIGH BRAKE.—Allen Ingalls, Hartwick Township, N. Y.

I claim the brake irons, B, combined with levers, D and E, rods, F and G, and sleigh, A, arranged as described and set forth, for the purpose specified.

77,046.—CAR COUPLING.—Eli H. Janney, Alexandria, Va.

I claim, 1st, The combination of the oscillating catch, E, mounted upon a pivot, E', in the mouth of a draw head, B, the movable bar, F, lever, I, and latch, D, when constructed and arranged substantially as and for the purpose set forth.

2d, The support or rest, H, when used as and for the purpose set forth.

77,047.—CHIMNEY COWL.—David F. Jauss, Harrisburg, Pa.

I claim, 1st, The combination and arrangement of the case, S, with the two inner cases herein shown, so as to effect the communication of exterior air with the products of combustion, in the manner as herein set forth.

2d, The case, S, and the tubes, n and R, constructed and arranged substantially as herein shown and described.

3d, The construction of the deflectors, B m and L, in relation to each other and the hats, H and W, as herein shown.

77,048.—LAND ROLLER.—Elijah O. Jones, Brandon, Mich.

I claim, 1st, Constructing a sectional roller in such manner that the weight of the rear section or sections may be transferred, when desired, to the front and outward sections, substantially as and for the purpose described.

2d, The frame, A, rollers, B B C, frame, C', lever, D, standard, a2, and seat, E, the whole being combined and operated substantially as described.

77,049.—MODE OF ATTACHING WHIP SOCKETS.—J. W. Kelley, Cleveland, Ohio.

I claim the hooks, C, loops, D, key, D, as arranged, in combination with the socket, A, for the purpose and in the manner substantially as set forth.

77,050.—CORN PLANTER.—D. A. Kershner, Elliottstown, Ill.

I claim, 1st, The combination of the bed plate, F, sliding dropping plate, H, hoppers, G, leather conducting spouts, J, projection, h', pivoted lever, I, and arms, e1 e2, with each other and with the axle, E, and frame, A, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the lever, M, cross bars, L and P, and leather straps, K and Q, with each other and with the bed plate, F, and plough beams, R, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the frame, W, concave rollers, X, scraping device, Y Z A', and lever, B', with each other and with the frame, A, substantially as herein shown and described, and for the purpose set forth.

77,051.—MUFF.—M. A. King, New York, N. Y.

I claim the spring strip, a, in combination with the other parts of the frame and muff, substantially as and for the purpose set forth.

77,052.—COMBINED SEEDER, CULTIVATOR, AND HARROW.—Daniel Kint, Hasleton, Iowa.

I claim, 1st, The agitator, E', lever, F', link, H', and friction rollers, I', constructed and arranged to operate in the manner and for the purpose specified.

2d, The cultivator, D, and harrow, K, as constructed and arranged in relation to each other, and operated by the wheel, C, arms, H a, and lever, J, in the manner and for the purpose substantially as set forth.

3d, The combination of the seeder, A', cultivator, D, and vibratory harrow K, when constructed and arranged to operate conjointly in the manner and for the purpose set forth.

77,053.—MITER GAGE.—George W. La Baw and Ira W. Fleming, Jersey City, N. J., and Aaron T. Hutchinson Harlem, N. Y.

We claim the arms, d, jointed to the stock, a, and connected by the links, g, to the clamp, e, that slides upon the stock, a, in combination with the saw guides, k, at the joint, i, and the saw guide, h, on the clamp, e, substantially as and for the purposes set forth.

77,054.—CENTRIFUGAL HYDRO-EJECTOR.—Hugh W. Lafferty and Robert Lafferty, Gloucester, N. J.

We claim, 1st, The combination of oil cup, C, sleeve, S L, hollow shaft, H S, and india rubber piece, I D, with the shaft, S, of a centrifugal ejector, the whole constructed and operated in the manner and for the purpose above set forth and described.

2d, The combination of inverted conical lug with hollow cone, C' o', and nut, H N, with shaft, S in the manner and for the purpose herein set forth and described.

3d, The combination of bearing boxes, B and B', and their braces, B d, ribs, R B, and bolts, b b and b' b', with india rubber, I D, hollow shaft, H S, oil cup, C', sleeve, S L, and shaft, S, the whole constructed and operated in the manner and for the purpose above set forth and described.

4th, The combination of waste oil cup, C', with the shaft of a centrifugal ejector, in the manner and for the purpose above set forth and described.

77,055.—BOOT HEEL.—George Lane, Hamilton, Ohio.

I claim the metallic plate, A, having flanges, B D, in combination with the heel, E, and the central screw for attaching said heel to the plate, as herein shown and described.

77,056.—COAL STOVE.—Dennis G. Littlefield, Albany, N. Y.

I claim, 1st, The complete separation of the covered magazine from the sides of the surrounding case, and the devices described whereby it is suspended and securely held in its proper position for use, while it may at pleasure be taken out of the case and again restored to its place, without injury or disturbance to the case.

2d, The adjustment, in the manner described, of the handle of the cover of the magazine.

3d, The reciprocal adaptation of the magazine cover, the flute plate, and the hopper to each other, and of the hopper to the cover of the burner, in the manner and for the purposes specified.

77,057.—CORN PLANTER.—H. C. Locke, Somersville, Tenn.

I claim, 1st, The reversible plows C C, mounted on the standards, a, constructed and arranged substantially as described, in combination with the drill tooth, E, and the seed hopper, F, as and for the purpose set forth.

2d, The seed hopper F, provided with the gate, b operated by the spring, c and cam, e, or the wheel, G, as and for the purpose described.

3d, The combination of the reversible plows, C C, drill tooth, E, and seed hopper, F, with its automatic discharging mechanism, and the dragging coverer, H, arranged and operating as described.

4th, The standard, a, constructed with two upright bars and a horizontal connection bar at the bottom, substantially as shown and for the purpose described.

77,058.—HARVESTER.—George G. Lyman, Independence, Iowa, assignor to himself and George P. Ladd, Milwaukee, Wis.

I claim, 1st, The combination of the driving wheel, A, friction rollers, a, in the rim, b, of said wheel, vibrating levers, c, sickle bar, e, and link, g, as herein described for the purpose specified.

2d, The vibrating levers, c c, in combination with the sickle bars, e e, and the link, g, as herein described for the purpose specified.

77,059.—LAMP SHADE SUPPORTER.—James W. Lyon, Brooklyn, N. Y.

I claim, 1st, Grooving the clamping ring center of the shade-holder on the inside, correspondingly with the bead on the lower corner of the chimney gallery of a kerosene lamp burner, substantially as described, whereby the clamping ring centre is held securely in place, and enabled to gripe the strongest part of the gallery, substantially as set forth.

2d, Adapting the clamping ring center of the shade holder to burners which have chimney screws, by removing a portion of the metal of the clamping ring center, which would otherwise interfere with the screw, substantially as described.

3d, Adapting the clamping ring center shade holders to burners which have chimney springs, by the relative arrangement of the radial arms with the clamping ring center, and its ears, and a clamping screw of sufficient length, so that the spring can play freely between the ears when thrown down to release the chimney, substantially as set forth.

4th, In combination with radial supporting arms, a clamping ring center, constructed substantially as herein described, so that it may be applied either to a burner having a chimney thumb screw, or to burners having chimney springs, at pleasure, and without change.

5th, In combination with a clamping ring center, extensible supporting arms, whether sliding or hinged, substantially as described.

77,060.—FRUIT CRATE.—Truman Mabbett, Sr., Vineland, N. J.

I claim, 1st, A double crate, composed of the slats, a a a a and b b b, corner uprights, d e, perforated bottom, A, all as substantially shown and described and for the purpose set forth.

2d, The spring bottom, substantially as shown and described, in combination with the double crate, all as and for the purpose set forth.

77,061.—SKATE FASTENING.—Charles B. Maedel and Jacob Wolf, Chicago, Ill.

We claim the bar, A, L shaped, provided with a loop at one end, and having a shoulder at its other, when connected to the skate by the heel calk, E, and to the boot or shoe heel by the eyelet screw, B, in the manner substantially as shown and described and for the purposes set forth.

77,062.—PENCIL CASE.—William Maginn, New York, N. Y.

I claim an article of manufacture, consisting of a pencil case, having whalebone cylinders, a, substantially as shown and described and for the purposes set forth.

77,063.—BOOTS AND SHOES.—Horace B. Marshall, Waldoboro, Me., assignor to himself and William W. Lummus, Lynn, Mass.

I claim making or forming loops, a a, of flexible material, alternately on each side of the openings for the string or lacing.

Also, in combination with the loops above claimed, a flexible string or lacing to draw the loops together.

Also, in combination with the loops and lacing, one or more eyelet holes, d d, to facilitate the fastening of the lacing.

Also, making or forming the loops for the string or lacing alternately on the edges of the openings of the various kinds of boots and shoes by perforating or cutting out the binding or edge facing of said openings.

77,064.—BUCKLE.—John A. Mashmeyer, Beardstown, Ill.

I claim a buckle, composed of the two parts, A B, fitting together or arranged substantially as shown and described, and with the pin or tongue, f, applied to the part, B, as set forth.

77,065.—VACUUM PAN APPARATUS.—Franz O. Matthiessen, Jersey City, N. J.

I claim the combination, with the vacuum pan, of an auxiliary air tight tank or vessel, provided with suitable air and discharge cocks or valves, and having connections under the control of appropriate cocks or valves, with an air pump, or its equivalent, and with the vacuum pan, both above and below, for operation in the manner described, and whereby a boiling, or any portion of a boiling, may be run off without destroying the vacuum in the pan, and a continuous boiling therein be kept up, substantially as specified.

77,066.—FENCE POST.—P. McDuff, Atchison, Kansas.

I claim the triangular fence post, constructed as described, consisting of the upright, A, having cleats, B, the inclined brace, D, short cross piece, E, and wire, m, as shown and described, for the purpose specified.

77,067.—PLANING MACHINE.—Horace G. McDuffe, Bradford, Vt. Antedated April 16, 1868.

I claim in a planing machine, as above described, a carrier, having its upper or outer surface formed into a series of beds or depressions, O P R, in shape the same as the shingle or clapboard to be planed, when constructed and operating in combination with the planer, X, substantially as and for the purpose set forth.

77,068.—SAFETY ATTACHMENT FOR POCKET BOOK.—Aaron McNeill, Cincinnati, Ohio.

I claim the flat spring catch, C, in combination with the socket, A B b, and ligament, D E, all constructed as herein represented and described, to prevent the abstraction of the pocket book without the knowledge of the owner, but permit him to readily detach it within the pocket when desired.

77,069.—BLACKING FOR LEATHER, ETC.—Ithamar B. Merrill, Dexter, Me.

I claim a blacking and polishing compound composed of the above named ingredients, in the manner and about the proportions substantially as described.

77,070.—APPARATUS FOR DISTILLING PETROLEUM.—James Miller, Alleghany City, Pa.

I claim, 1st, The combination of two or more vacuum stills, one, A, for heating the oil and driving off its more volatile ingredients, and the other, B, for carrying on a continuous distillation, by feeding therein the heated oil from still, A, through a coiled or zigzag pipe, m', with apertures, n, substantially as and for the purpose hereinbefore set forth.

2d, The use in the discharging end of the condensing pipe of oil distilling apparatus of a glass section, g g', and cock, f or f', in connection with the vacuum still, for ascertaining the rapidity of the condensation, and the quality of the product, substantially as above set forth.

3d, A coiled or zigzag pipe, m', with perforations, n, arranged in a vacuum still, B, with a continuous feed, either separately or in combination with the gage cocks, n'', constructed and used substantially as and for the purposes hereinbefore set forth.

4th, Utilizing the uncondensed gases and vapors which are passed over in the process of distillation, by feeding them from the receiving tanks through perforated pipes, l', into the furnace, substantially as hereinbefore set forth.

77,071.—CAR COUPLING.—Simeon Mills, Madison, Wis.

I claim the draw bar, B, secured in the draw head, A, in the manner specified, and provided with the hooks, C and D, and lug, E, as and for the purpose specified.

77,072.—ILLUSION TOY.—John A. Minor, Middletown, Conn.

I claim the toy constructed substantially as set forth, so as to produce the illusion as described.

77,073.—PREPARING JUTE YARN.—James Monach (assignor to himself, John Hutchinson and Jeffrey Hart), Philadelphia, Pa.

I claim as a new manufacture jute yarn treated with caustic alkali of from forty to fifty degrees Twadell's hydrometer, substantially as described for the purpose specified.

77,074.—METHOD OF MOVING BUILDINGS.—John H. Moore Binghamton, N. Y.

I claim the frames, A A, having three trucks each, and constructed as described, with transverse pieces, C, I and J, and springs, E, all in combination with the cross piece, G, resting on springs and rollers, substantially as described and for the purpose set forth.

77,075.—FEATHER RENOVATER.—James C. Morehead and Wm. W. Elliott, New Madrid, Mo.

We claim, 1st, In a machine for renovating feathers, the combination of the

water boiler, B, with the chemical boiler, D, and the pipes, G G', for the purpose of generating, conveying and uniting the two kinds of steam, preparatory to subjecting the feathers to their joint action.

2d The cylinder, I, when constructed of slats, i i i, slightly separated, in the manner and for the purpose set forth.

3d, The combination within a revolving cylinder of the tubular shaft, J, with the pipes, K K,' the latter being provided with valves, o o o, substantially as and for the purpose set forth.

4th, The combination of the boilers, D D, pipes, G G', cylinder, I, shaft, J, pipes, K K', valves, o o o, and stop cocks, r r, substantially as and for the purpose set forth.

5th, The method of purifying and renovating feathers, substantially as herein described.

77,076.—WRENCH.—Ira Morse, Danbury, Conn.

I claim a wrench having the bar, A, serrated rigid jaw, B, and hinge serrated jaw, D, attached to the sleeve, C, both jaws being divergent outward, and all constructed and arranged substantially as described.

77,077.—MACHINE FOR OPERATING CHURNS, ETC.—Ira Morse, West Franklin, Pa.

I claim the within described machine for operating churns, composed of the rockers, a, cross bars, B, platform, C, frame, D and E, forked post, F, lever, G, box, H, bar, I, lever, K, and block, L, for the purpose and substantially as herein described.

77,078.—WATCH.—Charles S. Moseley, Elgin, Ill.

I claim the combination of a stud and set screw or screws, for holding and fastening the outer end of a hair or balance spring to a watch movement, with a bridge plate or any equivalent therefor, substantially as described.

77,079.—SAWMILL.—J. W. Moyer, Cherry Valley, N. Y.

I claim, 1st, The combination with a gig saw, S, of two springs, s s', of equal power, the former at the upper end of the saw and acting upwards upon it, and the latter at its lower end, and acting downwards upon it, all the parts being constructed and combined and operating together substantially in the manner and for the purposes set forth.

2d, The combination of the boilers, pipes, cylinder, shaft, and stop cocks, substantially as and for the purpose set forth.

77,080.—STRIKING ATTACHMENT TO CLOCKS.—N. E. Mulford, Madison, N. J.

I claim, 1st, The arrangement of the seven detent pins, u u1 u2, etc., on the face of the hammer wheel, E, the said pins being set in a spiral line, as described, and at such distances apart that the required number of pins, i i, will be between every two adjacent pins, u, substantially as and for the purpose herein shown and described.

2d, The heart-shaped cam, O, when mounted on or connected by gear or otherwise with the tube, H, to which the hour hand is fastened, and when combined with a lever N, which is gradually raised or lowered by the rotation of the cam, so that its end will be brought into a different plane, substantially as and for the purpose herein shown and described.

3d, The lever, N, when arranged substantially as herein shown and described, in combination with the heart shaped cam, O, turning with the tube, H, and with the seven pins, u, u1, etc., arranged spirally on the face of the wheel, E, which carries the thirteen pins, i i, substantially as herein shown and described.

4th, The lever, m, when connected with the bar, o, and when raised and lowered by means of the cam, L, in combination with the stops, p, on the fly, F, all made and operating substantially as shown and described.

5th, Connecting the detent lever, N, with the retaining lever, M, and with the releasing lever, o, substantially as and for the purpose set forth.

6th, The arrangement and combination with each other of the heart shaped cam, O, lever, N, wheel, E, having the seven pins, u, u1, etc., cam, L, levers, o and M, and stops, p, on fly, F, all made and operating substantially as herein shown and described.

7th, The half-hour striking apparatus, when consisting of the hammer, P, rods, w and v, the latter being held by means of a spring catch, z, substantially as herein shown and described.

8th, Connecting the lever, M, with the catch, z, of the half-hour striking apparatus, so as to release the same, substantially as herein shown and described.

9th, The arrangement herein shown and described of setting the half-hour striking apparatus by means of the arm, l, of the main hammer, which catches the rod, y, of the half-hour hammer, locking it with the catch, z, when the main striking device is in operation.

10th, The cam, L, when mounted on the staff, G, as herein shown and described, and when provided with a recess, s, and with an elevation, b', opposite to the same, substantially as and for the purpose herein specified.

11th, Pivoting the arm, o, to the lever, M, and combining it with the spring, r, for the purpose of allowing the hands to be turned backward, substantially as herein shown and described.

12th, Setting the half-hour striking apparatus by means of the main striking apparatus, when the same is in motion, substantially as set forth.

77,081.—FURNACE DRAFT REGULATOR.—James F. Neall and Wm. Myers, Philadelphia, Pa.

We claim the arrangement of the piston, A, cylinder, B, packing ring, C, and weighted lever, E, substantially as described.

77,082.—SAW SET.—Jacob Noepel and Bernhard Assman, Newark, N. J.

We claim the short lower handle, B, pivoted in the slotted long handle, A, and provided with a cam, f, which works upward through the slotted handle against the lever, C, whereby the short handle is operated by the fingers of the hand, while the long handle is held comparatively stationary, as set forth.

77,083.—HOE.—G. H. Owens, Maysville, Ky.

I claim the ferule, D, the shank, B, with the teat, e, and the handle, C, constructed, arranged and combined substantially as and for the purposes described.

77,084.—LOCK-UP SAFETY VALVE.—Ralph G. Packard and Michael Hastings, Brooklyn, N. Y.

We claim, 1st, In lock-up safety valves, forming the weights in sections, adapted to be inserted and removed through openings, a, in the exterior or lock-up casing, substantially as and for the purpose herein specified.

2d, In connection with the above, dove-tailing together the several pieces, substantially as and for the surpose herein set forth.

77,085.—FUR MUFFLER.—G. W. Parker and W. F. Parker, Kalamazoo, Mich.

I claim as a new article of manufacture, the fur muffler, A, and lining, B, when the same are constructed in the form shown, and provided with head bands, D D', and the whole is so constructed and arranged as to operate substantially as described for the purpose specified.

77,086.—KNIFE FOR REMOVING THE SKINS OF ANIMALS.—S. J. Patterson, Bridgeport, Conn.

I claim as a new article of manufacture, a knife for removing skins from animals, constructed as described, consisting of the curved blade, A, having a back of irregular form, adjustably secured between the two sides, B C, having their edges beveled at different angles and forming the outer portion of the handle, E, said plate and sides being pointed at one end, in the form of a knife, as herein shown and described.

77,087.—PORTABLE FENCE.—Lewis P. Pease, McCordsville, Ind.

I claim the alternate long and short panels, so arranged that the adjustable brace, g, will bind two long and one short panel together, in combination with the long bars, e e, as and for the purpose set forth and described.

77,088.—GATE.—John J. Pellett, Oconomowoc, Wis.

I claim the combination of the pivoted bars, a a, with the enclosing frame, S S' T T1 T2, when operating substantially as and for the purpose set forth.

2d, The combination of the arms, H, connecting rod, h, and locking pin, k', when used in connection with a sliding gate, as above described, and with the wheel and cord for opening and shutting it, as a device for securely locking said gate, in the manner described.

77,089.—SKATE.—Richard Pohl (assignor to Oswald Unger), Port Huron, Mich.

I claim, 1st, The construction of a skate in substantially the form as described, that the spring of the skate will cause it to be firmly attached to the boot of the wearer.

2d, The slides, H and M, provided with set screws, J and N, the levers, G and F, and plate, L, when arranged and operating substantially as and for the purpose set forth.

3d, The combination of the above named parts with the runner, A, the heel plate, C, provided with the flange, P, and points, R, and the bar, E, when constructed and operating substantially as and for the purposes described.

77,090.—HOT WATER ELEVATOR.—Wm. E. Prall, Washington, D. C.

I claim in connection with a stove or like heater, and for domestic purposes, an automatic water elevator, constructed and operating substantially and for the purpose set forth.

77,091.—HARROW.—John Rankin, Taunton, Mass.

I claim the harrow constructed as described, and consisting of the bars, a1 a2 a3 a4, toothed rock shafts, D E F, having standards, G H I, crank shaft, P, bearing loose wheel, R, and fixed wheel Q, clutch S, lever T, three armed pivoted lever K, and pitmen, J M N O, all arranged and operating in the manner and for the purpose herein set forth.

77,092.—MILK CAN.—Charles A. Reight (assignor to himself, Henry B. Dill and George A. Swaim), Middletown, N. Y.

I claim the combination of the tin band, B, double seamed, with the tin top or bottom of a milk can, and soldered or riveted to the iron cylinder, A, of greater thickness than the said bands, or top or bottom, all substantially as and for the purpose shown and described.

77,093.—APPARATUS FOR CLIPPING THE HAIR OF ANIMALS.—Arthur Dallison Renshaw, London, England.

I claim, 1st, The cutters, a and b, constructed, combined and operating substantially as and for the purpose set forth.

2d, The combination of the said cutters with the adjustable presser bar, g and lever, k, and with or without the spring, m, for the purposes and substantially as set forth.

3d, Operating the lever, k, by means of a cord or wire passed through the handle, p, or over a rotating cam or disk, and connected with any suitable driving mechanism, substantially as set forth.

77,094.—STILL FOR DISTILLING HYDROCARBON.—Charles W. Requa, Albany, N. Y.

I claim, 1st, The use of steam in the distillation of liquid hydrocarbons in stills heated by external fire, when the steam is introduced into the still in such a manner that the lowest stratum of liquid therein will be continually removed from contact with the bottom of the still by the action of the steam and its place supplied with fresh liquid from above, substantially as and for the purpose above described.

2d, Constructing stills heated by an external fire, and in which steam is used, as and for the purpose above described, with an air chamber over them, constructed and operating substantially as and for the purpose above described.

77,095.—RUDDER GEAR.—C. T. Rideout, Boothbay Harbor, Me.

I claim the combination and arrangement of the toothed sector, C, having the tiller and socket, T T', the toothed disk, C', having projection, D, with hole, b, and the perforated arc, D', as herein described for the purpose specified.

77,096.—TOBACCO PIPE.—Henry R. Robbins (assignor to himself and W. H. Green), Baltimore Md.

I claim in a smoking pipe, composed of the stem, A, bowl, B, tube, D, and vessel, C, the minutely-foraminated screen, c, operating in connection with the tube, D, and vessel, C, substantially as and for the purpose specified.

77,097.—AMALGAMATOR.—William Robbins, Hinsdale, Ill., and Edward Swasey, Bucksport, Me.

We claim, 1st, The agitator f, arranged to operate in connection with the tube, B, substantially as described.

2d, An amalgamator, consisting of a tub for holding the mercury, and a rotating tube provided with arms for stirring and mixing the gold, or other material, with the mercury, and having its lower open end arranged to feed the material in the mercury near the bottom of the tub, with the agitator, f, for preventing the tube from becoming clogged or choked, all constructed and arranged to operate substantially as shown and described.

77,098.—REFRIGERATOR.—Henry A. Roberts, Boston, Mass.

I claim, 1st, A refrigerator, constructed of metal, or other suitable material, of two or more sections, substantially as and for the purpose described.

2d, Diminishing the interior capacity of a refrigerator chamber, by dividing, cutting off, or removing a portion thereof, for the purpose of economizing in the use of the cooling agent, substantially as described.

3d, The movable and adjustable frame, d', conforming to the interior shape of the refrigerator, with the receptacles, c, so formed that they fully utilize the interior capacity thereof, substantially as and for the purpose described.

4th, An ice box, having a close bottom, perforated sides, covered with absorbing fibrous material, whereby the box is rendered air-tight, substantially as described.

5th, An ice box, as above described, provided with a flue or series of flues, with or without radial divisions for the circulation and condensation of air, substantially as described.

6th, An ice box, as above described, provided with a flue or series of flues, with or without perforated sides or evaporating surface, substantially as described.

77,099.—COMPOUND FOR TREATING HIDES AND SKINS.—L. F. Robertson, West Farms, N. Y.

I claim a compound for treating hides and skins, made of the materials herein specified.

77,100.—LAMP CHIMNEY.—James Robinson Funkville, Pa., assignor to himself and William Robinson, Brooklyn, N. Y.

I claim the lip, b, formed of the partially-severed material of the flange, c, in the formation of the notch or recess, a', substantially as and for the purposes set forth.

77,101.—FENCE FOR POULTRY YARD.—Henry W. Rutt, Reedsburg, assignor to himself and Jonathan M. Rhoads, Wayne county, Ohio.

I claim the reel, C C, composed of two semicircular disks, connected together by a narrow slat at each side, and one at the bottom, and pivoted between the vertical fence posts, B B, directly above the fence, all constructed, arranged and operating as specified.

77,102.—MACHINE FOR CUTTING TOBACCO.—Christopher E. Rymes, Somerville, Mass., assignor to Robinson & Hearn, New York city.

I claim, 1st, A tobacco-cutting machine, in which the bar of tobacco to be divided is passed between the rectilinear surfaces of two traveling and converging endless chains or belts, one of which serves to support the bar, while to the other are attached the severing knives, substantially as described.

2d, Attaching the knives of a tobacco-cutting machine to one of two traveling and converging planes, so that the plane of the knife, while passing through the tobacco, shall, in every position, be parallel to its plane in every other position while so passing, and thus a square and smooth cut be secured, as specified.

3d, The links, l, constructed, arranged and operating as described and shown.

4th, The combination of a knife with one or more of the links of an endless chain, as specified.

77,103.—BRIDGE.—John Sanderson, Fredericksburg, Ohio.

I claim the bridge herein described, composed of sections, consisting of the cross ties or ribs, B B, and wings, A A, provided with lugs and recesses, as described, the several sections being bolted together, as and for the purpose set forth.

77,104.—NAILING OR PEGGING MACHINE.—Joseph F. Sargent, Boston, Mass.

I claim, 1st, A pegging or nailing machine, constructed substantially as described, so as to operate to automatically cut, at one location, short pieces from a long or wire-like formation of material, and to convey them, when so cut, to another location, where they receive the action of the driver.

2d, The tube, or a part thereof, through which the nails or pegs are to be forced into or toward the material to be united, made in two parts, capable of being closed and separated on a longitudinal plane passing through the tube, substantially as and for the purpose specified.

3d, The tube through which the nails or pegs are forced by the driver, made in two or more parts, of which one division is made substantially at right angles to the axis of the tube, so as to enable one part of the divided tube to be moved with respect to the other part or parts, substantially as and for the purpose described.

4th, The combination of the tube or groove, through which the wire is thrust to be subjected to the action of a cutter, with a cutter, for severing a nail or peg from the wire or wire-like material.

5th, The combination of intermittently-operating feed-rolls or wheels, for feeding material of a wire-like form, with cutters, for cutting off the material so fed, to form nails or pegs, substantially as described.

6th, In combination with feed-wheels, for supplying lengths of wire-like material to the cutters, the ratchet-wheel and pawl, and the adjustable shell or shield, v.

7th, A pegging or nailing machine, constructed substantially as described, so as to operate, in producing correct register of the awl-hole beneath the driver, by first transferring the contact of the sole from the nail-tube to the feed-foot, then causing the awl to enter and withdraw from the sole, then giving the feeding movement, to bring the awl and driving-holes in register, and keeping the contact of the feed-foot with the stock till the driver has made its driving-stroke, after which, by vertical movement of the feed-foot, contact of the sole is transferred to the driving-tube.

77,105.—MACHINE FOR MANUFACTURE OF SLATE PENCILS.—D. R. Satterlee, New Haven, Conn.

I claim, 1st, The combination of the two series of cutters, each series formed so that the first half forms the pencil, and while the second completes the pencil, and combined with the grooved plate, F, and correspondingly grooved bed, I, in relative position to each other, and to the two series of cutters described, so as to form guides from the first series of cutters to the second, and from the second to the discharge, substantially in the manner herein set forth.

2d, In combination with the above, the feed-rolls, D and k, arranged and operating in the manner substantially as described.

3d, The arrangement of the cutters between the heads, L, so as to be set and adjusted, substantially in the manner described.

77,106.—ENAMELED WATER-COOLER.—Charles C. Savery, Philadelphia, Pa.

I claim, 1st, The mode of enameling the inside and outside of the water and ice-tank (or both, if used separately) of a water-cooler and refrigerator, in the manner and for the purpose above set forth and described.

2d, The combination of a water and ice-tank or water and ice-tanks, enameled inside and outside, with a water-cooler and refrigeraror, for the purpose and in the manner above set forth and described.

3d, The combition of vitiated air discharge-tube or pipe, M T, with the provision chamber of a water-cooler and refrigerator, in the manner and for the purpose above set forth and described.

77,107.—WRENCH.—Thos. A. Searle, Providence, R. I.

I claim the sliding collar, D, and spring, S, in combination with the handle, H', shank, H', toothed segment, B, stationary jaw, A, slotted movable jaw, a, and pivots, a1 a2, all constructed, arranged, and operating as and for the purpose described.

77,108.—BALING-PRESS.—Geo. W. Serrin, Memphis, Tenn.

I claim, 1st, The toggle-levers, when suspended upon the cords or chains, F H, forming flexible suspension points, whereby bales of unequal size are pressed with equal force by the platens, C, substantially as herein set forth.

2d, The arrangement of the cords, F H, pulleys, e e', and windlass, G, as herein described, for the purpose specified.

77,109.—FENCE.—N. Lawrence Shaw, Wilson, N. Y.

I claim the combination of the fence-panels, A A, with the wire or wires, e, applied substantially in the manner and for the purpose specified.

77,110.—OYSTER-WINDER.—Samuel S. Shaw, Newport, N. J.

I claim, 1st, An oyster-winding apparatus, consisting of the shaft B, sliding drum, C, gear-wheels, b c and d, and pivoted segment, F, all made and operating substantially as and for the purpose herein shown and described.

2d, The drum, C, when arranged so that it can turn and slide on the shaft, B, and when combined with the gears, b c, and with the lever, D, all made and operating substantially as set forth.

3d, The block, F, when pivoted to the frame, A, and when provided with the friction-roller, c, as set forth.

4th, The slotted bar, e, for elevating the block, F, in combination with the same, and with the drum, C, all made and operating as set forth.

77,111.—MODE OF SURFACING SHEET-IRON AND METAL PLATES.—Thomas Shaw, Philadelphia, Pa.

I claim the application of carbonaceous material to the heated surfaces of iron and steel, whilst being rolled or otherwise manipulated upon, substantially as and for the purpose set forth.

77,112.—FURNACE DOOR FASTENING.—P. E. Shear, Saugerties, N. Y.

I claim the hinged or jointed bar, E, in combination with the hinged link, c, and the eccentric, F, all constructed, arranged, and applied to the frame or mouth-piece of a furnace, substantially as and for the purpose set forth.

77,113.—BED-BOTTOM.—Philander P. Simmons, Davenport, Iowa.

I claim a spring bed-bottom, consisting of a web made of slats, d, woven together with wire, in combination with the wooden strips, e, and the spiral springs, f, or their equivalents, when constructed and arranged substantially as described.

77,114.—OPERATING WINDOW-SHUTTERS.—Thomas J. Sloan, New York city.

I claim the employment, in combination with the gears, K f, and shaft, H, of the retaining-catch bar, b, and a cam, O, for lifting the same, the whole arranged to operate substantially as described, for the purpose set forth.

Also, the employment, in combination with the hinge-sector, f, and stand, D, of a swinging or movable retaining pendant, F, arranged to operate as described for the purpose set forth.

77,115.—LAMP SHADE.—Austin A. Smith, Seneca Falls, N. Y. Antedated April 11, 1868.

I claim, 1st, As a new article of manufacture, a lamp or gas-light shade of usual form, composed of numerous upright panels or sections, C C C, situated closely together to form a screen, and turning horizontally or angularly on suitable joints, the whole arranged and operating so that any number of said panels may be opened at any desired position, and the passage of light may be graduated, as herein set forth.

2d, Forming one or both of the joints of the panels, of spring-wires, i i, resting in the square or oblong slots, d, operating as and for the purpose specified.

77,116.—TILTING CHAIR.—Calvin D. Smith, Baldwinville, Mass.

I claim the arrangement and combination of the spring, the bands, and the barrel or roller, as applied to the chair and its stand.

Also, their arrangement with and application to the stand and chair, substantially in manner as specified.

77,117.—TILTING CHAIR.—Calvin D. Smith, Baldwinville, Mass.

I claim the combination as well as the arrangement of the stud, a, the stop bar, d', the two arms, b b, and the spring, e, as applied to the chair and its supporting frame, D, and connected together, substantially as specified.

Also, the arrangement of the stud, a, the stop bar, d', the two arms, b b and the spring, e, with the chair and its supporting frame, D.

77,118.—BRICK MACHINE.—John H. Smith and Charles H. Florence, Richview, Ill, assignors to themselves, F. P. Seawell, and H. G. W. Whittenburg.

I claim, 1st, The combination of the pivoted frame, I, bearing the rollers, J, mold holder, K, hopper plate, d, inclined pawls, M, upon shaft, N, the segment, P, and straps, U, all arranged and operating as described for the purposes specified.

2d, The mold, L, the sides, H, and ends, I2, of which are connected to the bottom, I3, and to each other by inclined prongs, T, arranged substantially in the manner herein shown and described, and for the purpose set forth.

77,119.—RAILROAD SILL AND CHAIR.—Jasper Snell, Pottsville, Pa.

I claim 1st, The base plate, A, walls, B, and springs, G, all substantially as and for the purpose set forth and described.

2d, The plate, C, dovetailing between the walls, B, and provided with the lugs, c, substantially as above set forth and described.

3d, The chairs, D, dovetailing between the walls, B, and provided with the jaws, d d, in manner substantially as above set forth and described.

4th, The railroad sill and chair consisting of a base plate, A, walls, B, and place, C, resting on springs, G, in combination with chairs, D, furnished with the jaws, d d, in manner and for the purposes substantially as above set forth and described.

77,120.—HORSE HAY FORK.—N. Starr, Jr., Homer, N. Y.

I claim the two spurs, a, pivoted at their lower ends to the stock, A, in combination with the shifting bar, c, and toggle braces, b, substantially as herein set forth for the purpose specified.

77,121.—COMBINED RULE AND POCKET KNIFE.—O. B. Steele, Franklin, Pa.

I claim combining a jointed rule with the handle of a pocket knife, substantially as and for the purpose shown and described.

77,122.—DOOR STOP.—A. G. Stevens, Manchester, N. H.

I claim, 1st, A door stop, constructed as described, consisting of the pivoted lever, G, formed at the lower end into a toe, F, spring, L, cushion, K, and case, E J.

2d, The combination of pivoted lever, G, spring, L, and cushion, K, with the case, E J, attached to the lower part of the door, A, substantially as described.

3d, Operating the door stop by means of the trip pin, N, substantially as described and for the purpose specified.

77,123.—COMPASS.—H. Stewart (assignor to G. F. Wright and Wm. Orr, Jr.,) Clinton, Mass.

I claim the combination, in one instrument, of dividers and inside and outside calipers, by use of the adjustable combination points, used in the manner and for the purpose herein described and set forth.

77,124.—APPARATUS FOR BURNING HYDROCARBON.—F. T. Suhr, Titusville, Pa. Antedated April 7, 1868.

I claim, 1st, The cap or cover, C, together with the inside partitions, m m, and the reducer, P, for the purpose of confining and directing the currents of air upon the flame before they can pass out of the opening at the top.

2d, The combination of the frame, draft-pan, oil dish, and covers, as above described, all so placed, air-tight, in the fire box or chamber, that no air can pass into the said fire box, except such as passes through the draft pan aforesaid, for the purpose of producing heat from crude petroleum or other combustible fluids.

77,125.—HORSE HAY FORK.—J. B. Sweetland, Pontiac, Mich.

I claim, 1st, The arms, A and A', constructed substantially as represented, and provided with two sets of tines, G G and H H, as and for the purpose set forth.

2d, The cross head, J, provided with two or more tines, and adjustably or rigidly connected to the arms, A A', as and for the purpose set forth.

77,126.—INDEXING BOOKS AND LEDGERS.—J. H. Swindell, Camden, N. J.

I claim arranging an alphabeticall or numerical index for books, by cutting two or more sets of notches in the margins of such books, and by making appropriate marks to each of the notches, substantially as and for the purpose herein shown and described.

77,127.—TRUNK.—C. A. Taylor, Chicago, Ill.

I claim the method of securing trunks, as herein described, by means of the braces, D, and studs, I, or their equivalents, arranged to operate substantially as herein set forth.

77,128.—SHINGLE MACHINE.—Albert Thompson, Ridgeway, Pa.

I claim, 1st, The combination of the carriages, I I I, having the barbed coupling bolt, m3, with the barbed dogs, m m, spring, m1, and cord and pulley, m2, by which either of the carriages can, independently of the other, be instantly attached to or detached from the shifting beam, L, which operates them.

2d, The combination of the cam wheels, S, having the cams, s s s s, formed and operating in the manner described, with the shaft, N, having the spur wheels, n' n', the spurs of which are at different distances apart, the whole operating together in the manner and for the purposes set forth.

77,129.—SAW MILL.—C. R. Tompkins and John Wright, Rochester, N. Y.

We claim the movable saddle, d, turning on the hub, l, and adjusted by the set screws, H H, and the slots, J J, with their confining screws, all adjusted to operate substantially as described.

77,130.—TRY SQUARE.—E. J. Toof, Fort Madison, Iowa. Antedated April 11, 1868.

I claim, in combination with a try square, A, an adjustable cutter, B, arranged and operating substantially in the manner and for the purposes set forth.

77,131.—PAPER CLAMP AND INKSTAND COMBINED.—E. J. Toof, Fort Madison, Iowa.

I claim the combination of the paper holder, A, with the inkstand, E, provided with a cover, F, with or without the sponge arm, G, shaft, I, whether extensible or not, and the crank, J, or its equivalent, arranged and operating substantially as and for the purposes herein described.

77,132.—CARRIAGE COUPLING.—Ira Van Pelt and J. S. Van Pelt, Petersburgh, Va.

We claim the combination of the sliding pivoted swingle tree, E, with the chains, I J J, axle, C, and bolster, G, substantially as and for the purposes specified.

77,133.—SCAFFOLD BRACKET.—Samuel D. Van Pelt, Anderson, Ind.

I claim the plate, A, with claws, B, and upright, H, the dog lever, I, with dogs, E E, pivoted to the upright, H, of the plate, A, and the upright, D, pivoted to the dog lever, I, all constructed and operating substantially as shown and described and for the purpose specified.

77,134.—HORSE HAY FORK.—Edward L. Walker, Benford's Store, Pa.

I claim, 1st, A prong at the lower end of a hay elevating fork, in combination with the sliding bar, e, or equivalent mechanism, that acts to turn said prong up below the hay, substantially as set forth.

2d, The link, k, and lever, h, in combination with the bars, e and a, and prong, l, substantially as specified.

77,135.—BUTTER WORKER.—Emory P. Walker, Belchertown, Mass.

I claim the diagonal flanges, D D, placed at the mouth or front end of the bottom, A, of the box, with a hole, x, as described, the various parts being constructed and operating as specified.

77,136.—HORSE HAY FORK.—Joseph H. Walker, Grand Rapids, Mich.

I claim the cam lever, D, pivoted between the upper ends of the bars, C C, and arranged to operate in combination with the curved bar, B, when said bar is provided with a stop at its end, and as a recess, as described, all constructed and operating substantially as specified.

77,137.—MACHINE FOR BORING HUBS.—J. W. Walters, Riceville, Iowa.

I claim the combination of the two shafts, A K, the latter having the crown gear wheel, G, tubular shaft, H, box, B, adjustable cutter, E, having the pinion, F, all operating as described for the purpose specified.

77,138.—PROCESS OF TREATING WOOLEN AND SILK GOODS.—Gardner Warren, Roxbury, assignor to himself and Hezekiah H. Bryant, Boston, Mass.

I claim the process of treating fabrics, made of wool, silk, or other animal fibers, with a solution of glycerin, substantially as described.

77,139.—BEEHIVE.—Jas. Wash, Mount Sterling, Ill.

I claim the combination of the box, C, provided with partitions having spaces, E, passages, h i, with the hives, C', substantially as and for the purpose described.

The combination, with the box, C, and hives, C', of the perforated passage, D, and outer housing, A, substantially as and for the purpose described.

The combination, with the box, C, and hives, C', of the perforated passage, D, and outer housing, A, and the self-adjusting guard, H, substantially as and for the purpose described.

The combination, with the hives, C', and long perforated passage, D, of an outer housing, provided with the odor passages, F, substantially as and for the purposes described.

77,140.—EGG CUP.—C. D. P. Watters, New York city.

I claim an egg cup consisting of the base, A, springing jaws, B, levers, D, and handle, E, all made and operating substantially as herein shown and described.

77,141.—SEED SOWER AND HARROW ATTACHMENT TO GANG PLOW.—J. B. Webster, Stockton, Cal.

I claim, 1st, The plow frame, a a' b, provided with means for attaching a seeder to its front end, and provided also with the frame, d d', at its rear end for the attachment of a seeder, substantially as described.

2d, The bracket, e, in combination with the plow frame, a a' b, as and for the purpose described.

77,142.—FARM GATE.—B. Weirich and John Smith, Middlebury, Ind.

We claim, 1st, the sections, C C', lever, h, and brace, k, combined and operated as and for the purpose described.

2d, The swinging bars, b b, sections, C C', lever, h, and brace, k, all arranged as described.

77,143.—MEAT CUTTER.—Charles Welte, Frankford, Pa.

I claim the combination of the revolving meat box, B, gear wheels, I and H, vertical shaft, G, bevel gear wheels, F and E, horizontal shaft C, crank wheel, D, gear wheels, J and K, short horizontal shaft, L, crank or crank wheel, M, connecting rod, N, pivoted and balanced lever, O, and slide, R, to which the cutter, T U V, is attached, substantially as herein shown and described, and for the purpose set forth

77,144.—CHURN.—Amos Wescott, Syracuse, N. Y.

I claim the combination of the conical body, adjustable leg, horizontal dasher shaft, and alternately oblique dashers, and fan wheel, substantially as described, for the purposes set forth.

77,145.—HARVESTER.—Cyrenus Wheeler, Jr., Auburn, N. Y.

Division A.

I claim, 1st, A main frame, having an axle for the drive wheel, formed or cast on one side, and a hollow cylinder arm on the other side, for supporting the shaft of the bevel wheel.

2d, The main frame, as described, in combination with a tongue frame, hinged to the hollow cylindrical arm of the main frame.

3d, The combination of a main frame, having an axle for the driving wheel on one side, and a hollow cylindrical arm on the other side, with a crank frame hinged to said arm, so as to vibrate independently of the main frame in following the undulations of the surface of the ground over which it is drawn, substantially as described.

4th, The combination of a main frame, constructed as described, with a tubular box for holding the bevel wheel shaft.

5th, The crank frame, arranged and vibrating as described, in combination with a stop on the main frame, and a wheel and lever mounted on the shoe, for raising the cutting apparatus.

6th, The driver's seat, mounted on the main frame in a position behind the main drive wheel, in combination with a crank frame so hinged to said main frame as to vibrate independently of said frame and seat.

7th, Connecting the draught to a standard on the crank frame, in combination with hinging said crank frame to the main frame, on an axis coincident with the axis of the bevel wheel, but independent of the main axle.

77,146.—HARVESTER RAKE.—Cyrenus Wheeler, Jr., Auburn, N. Y. Division B.

I claim, 1st, In a combined reel and rake, the arms of which are hinged, independently of each other, to and travel around an axis perpendicular, or nearly so, to the platform, arranging said axis on the vibrating crank frame in front of a line drawn along the front edge of the finger bar.

2d, Mounting the axis of a combined reel and rake on a vibrating crank frame, which can rise and fall independently of the main or gear frame.

3d, The location of the axis of a combined reel and rake, upon a vibrating crank frame, behind the axis of the main wheel, in front of the finger bar, and outside of a line drawn across it at right angles, and touching the outside of the shoe.

4th, In a combined reel and rake, the arms of which are hinged to and move around an axis perpendicularly, or nearly so, to the platform, hinging the rake heads to the arms, and so combining them with mechanism, under the control of the driver, that the teeth of the rake shall, in reeling, retain a vertical position until they reach the finger beam, and then roll back to pass over the platform, and in raking retain a vertical position in their passage over the platform for the discharge of the gavels.

5th, Driving a combined reel and rake, located on one side of and below the highest point of the drive wheel, by mechanism connecting it with the hub of the wheel on the other side, substantially as described.

6th, Adjusting and supporting the crank frame and inner end of the cutting apparatus, in reaping, by a chain, connected with a lifting wheel and lever, mounted on the main frame, substantially as described.

7th, Changing the angle of cut and the inclination of the platform by means of a pinion in the draught frame, combined with a sectorgear on the main frame.

8th, The ridge board or inclined track on the grain divider, in combination with the overhanging ends of the rake heads.

9th, The employment of set screws, in combination with the rake and reel arms, and the revolving head, to which the arms are pivoted, for adjusting the height or angle of the rakes.

10th, A combined rake and reel, the arms or rake heads of which rotate about a shaft or pivot in advance of the finger bar, and are of sufficient length to reach the point of the divider in reeling in the grain, in combination with an inclined track or ridge board for raising the rake heads to pass the cutters.

11th, Automatically retracting the rake head, to cause the rake teeth to resume their vertical position by means of the lower heel end of the cam way acting upon the inner or heel end of the rake head, substantially as described.

77,147.—CARRIAGE HUB.—Martin Whelan, New Haven, Ct.

I claim the plate, C, provided with the arms, or lugs, a, combined with the hub, A, and spokes, B, and the plate, D, when the whole are constructed and united substantially in the manner herein set forth.

77,148.—DOVETAIL MACHINE.—T. D. White, Cincinnati, O.

I claim the combined arrangement of a series of saws of unequal diameters, and an olique table for feeding planks thereto, as and for the purposes herein specified.

77,149.—MACHINE FOR MAKING DOVETAIL MORTISES.—Thayer D. White, Cincinnati, Ohio.

I claim the removable block, B, having two oppositely inclined planes, B' B'', and employed in conjunction with the sliding gate, D, and chisels, d d, substantially in the manner and for the purpose set forth.

77,150.—CAR COUPLING.—W. F. Wickersham and Elisha Roush, Springfield, Ill.

We claim the combination of the rod or pin, D, gate, C, link, B, buffer, A, pivot, a', and arm a, substantially as shown and described, and for the purpose set forth.

77,151.—MACHINE FOR JOINTING STAVES.—Hiram S. Wiley, Madison, Ind.

I claim, 1st, The curved guides, B B, carrying the movable saw frame, G, said guides being concentric with the driving shaft placed above the frame, whereby the tension of the belt from said driving shaft to the pulley, H, on the saw carriage is regulated, as herein shown and described, for the purpose specified.

2d, The combination of the movable curved racks, C C, with the pinion M, and the movable saw bed, G, substantially in the manner herein shown and described.

3d, The devices, m2 m2 m m h h' g g n, and the treadle, k, for operating the curved racks, C C, working together, substantially as herein shown.

4th, The clamps, c c' c r' r', and their connections, m m m1 m1, for operating, the same, as substantially set forth.

5th, The combination of the catch, e, and its wiper, f, with the saw bed and lifting devices, substantially as herein shown described.

77,152.—SLIDE VALVE.—William Wilson, Galesburg, Ill.

I claim, 1st, A steam sliding valve, provided with two exhaust chambers, C, and the two exhaust steam passages, a2, and the steam passage, a1, whereby the steam is both admitted to and exhausted from a steam cylinder by double openings, substantially as shown and described.

2d, A steam valve provided with the steam passage, a1, and the exhaust passage, a2, and the chambers, C, in combination with the steam and exhaust ports, of any valve seat, A, substantially as shown and described and for the purposes set forth.

77,153.—CONCRETE BRICK PRESS.—J. H. Wirt, Delphi, Ind.

I claim, 1st, The compound toggle joint, consisting of the toggle bar, k, link rod, e, step lever, h, and lever, a, substantially as shown and described, in combination with the uprights, d, and bottoms, u, for the purpose of compressing concrete blocks, all arranged as set forth.

2d, The press constructed as described, and consisting of the molds, b, cover, C, link, E, lever, D p, bottoms, u, uprights, d x, guide, m, lever, G r s, toggle bar, k f l, step lever, h i, link, e, and lever, a, all arranged within the frame, A, and operating in the manner and for the purpose set forth.

77,154.—FERMENTATION BUNG.—Wm. W. Woodruff, New Britain, Conn.

I claim the bung, a, cup, a', tube, a'', and cap, b, constructed and arranged substantially as and for the purpose described.

77,155.—DROP HAMMER.—James Wool (assignor to himself and F. Bunnewell), Boston, Mass.

I claim in combination with the weight, and lifting rollers of a drop hammer, a lifter having a stiff central body of wood, or its equivalent, faced on both sides with leather, or other equivalent yielding material substantially as and for the reasons set forth.

77,156.—APPARATUS FOR CARBONIZING GAS.—Wm. H. Laubach, Philadelphia, Pa.

I claim the hollow glass gage tube, C, caps, f f, straps, d d, set screw, e, and tubes, g g, in combination, made in the manner and for the purpose described.

REISSUES.

2,920.—GEARING.—The Metropolitan Washing Machine Co., Middlefield, Conn., assignees of S. W. Palmer and J. F. Palmer, Auburn, N. Y. Patented May 8, 1866.

We claim the combination of toothed or cogged wheels, when used in pairs upon the same shaft, with a plate or plates arranged upon the interior opposite or exterior opposite faces of either pair, in the manner described, whereby the wheels on the one shaft shall be held in place by the plate or plates of the wheels on the other shaft, and thus prevent the lateral play of the one shaft with respect to the other, as set forth.

2,921.—CONSTRUCTION OF JUG TOPS.—Homer Wright, Henry H. Collins, and Benj. F. Collins, Pittsburg, Pa., assignees of Homer Wright. Patented Sept. 24, 1867.

I claim, 1st, The flange, S, when made as and for the purpose shown.

2d, The hinge and knob combined in one piece, as specified.

3d, The lid, when made to cover entirely the top rim of the body, as set forth.

4th, The opening, H, in the lid, when used in combination with the hinge and knob piece, as described.

5th, The convex bulge, P, or its eqvivalent, when used for the purpose indicated.

6th, Hinging the lid so as to rotate from the inside of the body, as described.

DESIGNS.

3,000.—BURIAL CASKET.—Wm. G. Algeo, Pittsburg, Pa.

3,001.—STOVE.—Isaac J. Baxter, Peekskill, N. Y.

3,002.—ORNAMENTATION OF A HORSE BRUSH.—James A. Bradley and Foster N. Smith, New York city.

3,003.—TRADE MARK.—J. H. Garnhart, St. Louis, Mo.

3,004.—LEGS OF A TABLE.—Willard Jefts, Battle Creek, Mich.

3,005.—SAD IRON.—Anna Niffeler, Chicago, Ill.

3,006.—CLOCK CASE.—Noah Pomeroy, Hartford, Conn.

3,007.—TRADE MARK.—Geo. L. Witsil, Philadelphia, Pa.

3,008.—ORNAMENTING TRUNKS, ETC.—Henry Wolf, Detroit, Mich.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

69,612.—ROOFING COMPOUND.—Oscar N. Bartholomew, and J. S. Thurston (assignees of Oscar N. Bartholome, and W. P. Sherman), Elmira, N. Y. Dated October 8, 1867. Application for reissue received and filed March 11, 1868.

We claim a compound of matter compounded from the ingredients named, and in the manner substantially as and for the purpose set forth.

70,247.—LAMP.—HOWARD TILDEN (assignee of William Mullaly), Boston, Mass. Dated October 29, 1867. Application for reissue received and filed March 27, 1868.

I claim, 1st, Supporting the top or dome of the blaze cap upon a cylindrical base arranged somewhat above the convex base, G, so as to leave an opening between it and the base for the air to pass out and up, to supply air to the flame above the cap, and keep the bottom of the chimney and the base cool.

2d, The deflectors, J J, extending down from the ends of the slot in a blaze cap, with closed sides, substantially as described.

3d, Making lugs or supports on the base plate, to fit recesses in the side of the cap, so that the cap may be readily removed from the base plate, to trim the wick and clean out the base.

4th, In combination with the base on the base plates, A and G, I claim the pins or lugs thereon, for supporting the chimney and the wires or springs, k k, for keeping it in place, substantially as described.

57,125.—PULLEY ATTACHMENT FOR RAISING WEIGHTS.—Geo. W. Gregory, Watertown, N. Y. Dated August 14, 1866. Antedated February 14, 1866. Reissue No. 2,784. Dated October 22, 1867. Application for reissue received and filed March 27, 1867.

I claim, 1st, As an adjustable pulley support, having one or more sockets or their equivalents, by and through which the pulley support may be operated and changed from place to place substantially as described.

2d, An adjustable pulley support, provided with sockets or equivalents and with means for supporting the pulley, substantially as described.

3d, The combination of an adjusting pole, with a pulley support, having sockets or equivalents, substantially as and for the purpose set forth.

73,937.—WATCH.—O. F. Stedman, Ravenna, Ohio. Dated January 28, 1868. Application for reissue received and filed March 27, 1868.

I claim the ring or band, C, bevelled or made thin at one edge or side, said band being made narrower than the movement, and wide enough to cover the space between the plates, a and b, substantially as and for the purposes herein set forth.

11,892.—MANUFACTURE OF BUCKLES.—The West Haven Buckle Company, West Haven, assignees of Sheldon S. Hartshorn, Orange, Conn. Dated November 7, 1854. Application for reissue received and filed March 28, 1868.

We claim, 1st, A bushel, in which the tongue is constructed so as to clasp the divided side, so that while it sustains the said divided side, it will turn freely thereon substantially in the manner herein set forth.

2d, The combination of the two parts or loops, one side of which is divided and the two parts or loops, hinged together as described, and the divided side sustained by the tongue, clasped and hinged thereon, substantially as set forth.

44,337.—PUMP.—Eli Perry, Baldwinsville, N. Y. Dated September 20, 1864. Application for reissue received and filed March 30, 1868.

I claim, 1st, The combination with the wings, E, of the concentric arms, or extensions, E', forming a division between the discharge space, B, and the interior of the case, except through passages, l, in the manner and for the purpose specified.

2d, The combination with the wings, E, and extensions, E', of the flanges, k, in the manner and for the purpose specified.

3d, Forming the under side of the wings, with sharp edges, l l, the same being used in combination with the floor of the case, A, substantially as described.

70,245.—IRON BRIDGE.—David H. Morrison, Dayton, Ohio. Dated October 29, 1867. Application for reissue received and filed March 31, 1868.

1st, The construction of the arch or top chord of a bridge by the use of the iron, I, beam, when arranged therein with its double flanges, in vertical planes, substantially as described, for the purpose specified.

2d, The universal washer, B f, constructed and applied in the manner and for the purpose specified.

3d, The combination and arrangement of the arch beams, C, arch, joint plates, g, and universal washer, B f, when constructed, connected, and operating, conjointly in the manner substantially as and for the purpose specified.

4th, The combination of the returned ends, p' p', of the chord bars, a, with the skew back, D, and block, r', substantially as and for the purpose specified.

73,552.—SASH FASTENING.—C. M. Amsden, Wooster, Ohio. Dated January 21, 1868. Application for reissue received and filed 1st, 1868.

1st, The use of a lever, having its fulcrum on the face of the sash or door, and acting in combination with a sash or door bolt, for the purpose of operating said bolt, substantially as herein specified.

2d, The lever, L, with hole, R, and slot, S, constructed and used substantially in the manner and for the purpose herein specified.

3d, The bolt, D, with arms, N O, and peculiarly shaped head, P, and with or without the spindle, F, the several parts being constructed and arranged as herein specified.

4th, The peculiar arrangement and combination of the bolt, D, with arms, N O, hole, H, slot, V, and lever, L, with hole, R, and slot, S, the several parts being arranged in the manner and for the purpose specified.

12,382.—MAGAZINE SMOKE CONSUMING STOVE.—James Easterly, Albany, N. Y. Dated February 13, 1855. Application for reissue received and filed April 3, 1868.—Division 1.

I claim constructing a stove as herein described, with openings for the admission of air to the burning fuel, at some point or points above the grate, including between said points and the grate sufficient fuel for ignition at any one time, substantially as described.

12,382.—MAGAZINE SMOKE CONSUMING STOVE.—James Easterly, Albany, N. Y. Dated February 13, 1855. Application for reissue received and filed April 3, 1868.—Division 2.

1st, A cooking stove, which is provided with a coal supply magazine, and a combination chamber, arranged without the space inclosed by the outer walls of the stove, substantially as described.

2d, The combination of a coal supply magazine, with a cooking stove, when such magazine is wholly outside of the outer walls of the stove, substantially as described.

3d, In a cooking stove, having a magazine for supplying the combustion chamber with fuel, I claim inlets for the admission of air to the burning fuel, arranged at some point or points above the grate, substantially as described.

4th, The relative arrangement of the several parts of the stove, whereby the heated products are caused to circulate around the oven, substantially as described.

70,510.—PREPARING CEMENTS FROM SLAGS.—John J. Bodmer, Newport, England. Dated Nov. 5, 1867. Application for reissue received and filed March 26, 1868.

1st, I claim the rolling, laminating, grinding, and otherwise reducing or converting to scale or sheets, or to a lamellated or to a pulvurulent state or condition, the cinder, slag, or scoria obtained from blast furnaces, copper smelting, or other furnaces, in a fluid or semi-fluid or pasty or viscous condition, in the manner and for the purposes substantially as described, and for other purposes.

2d, The rolling, laminating, grinding, and otherwise reducing or converting to scale or to a lamellated or to a pulvurulent condition, of various descriptions of cement and of materials from which cements are to be produced, substantially as described.

3d, The application of slag, cinder, or scoria, whether artificially prepared for the purpose or as obtained from blast furnaces or other furnaces in the manufacture of cement and the several modes or processes employed in the preparation of cements, substantially as described.

4th, The manufacture of artificial stone from the above described cements, either by themselves or with the admixture of coarsely ground materials such as furnace slags, scoria, any descriptions of hard stones, or of shingle, sand or other materials of a similar nature.

70,247.—LAMP.—Howard Tilden (assignee of Wm. Mullally), Boston, Mass. Dated Oct. 29, 1867. Application for reissue received and filed March 27, 1868.

I claim as the invention of Wm. Mullally, 1st, Supporting the top or dome of the blaze cap upon a cylindrical base arranged somewhat above the convex base, G, so as to leave an opening between it and the base for the air to pass out and up to supply air to the flame above the cap and keep the bottom of the chimney and the base cool.

2d, The deflectors, J J, extending down from the ends of the slot in a blaze cap with closed sides, substantially as described.

3d, Making lugs or supports on the base plate to fit recesses in the side of the cap, so that the cap may be readily removed from the base plate to trim the wick and clean out the base.

4th, In combination with the base or the base plates, A and G, I claim the piers of lugs thereon for supporting the chimney, and the wires or springs, K K, for keeping it in place, substantially as described.

75,070.—HARVESTER.—Wm. H. Stevenson, Auburn, N. Y. Dated March, 3, 1868. Application for reissue received and filed April 4, 1868.

I claim, 1st, The combination with a dished driving spur wheel, D, of a spur pinion, E, bevel wheel, H, and bevel pinion, I, which will admit of the arrangement of the crank shaft, J, substantially as and for the purpose specified.

3d, The arrangement of the gear wheels, D E H I, the wheel, E, running loosely on a shaft, F, and being provided with a clutching face, f, and shipping lever, G, substantially as described.

3d, The adjustable shifter holder and guide, G, constructed in one piece and attached to the main or draft frame by bolts passing through one or more slots in the shifting plate, G2, whereby the shifter fork may be adjusted to the groove in the spur pinion, substantially as described.

4th, The combination with the drag bar of a curved guide, S, moving endwise, of a guide box, K, arranged on the main frame, substantially in the manner described, whereby an unobstructed space is left below the frame when the drag bar is raised.

5th, The arrangement of the adjusting lever, T, linked connection, L, and curved guide, S, the latter working loosely in a guide box, K, on the frame, in combination with the drag bar, P, all substantially in the manner shown and described.

15,882.—HARVESTER.—John G. Perry, Kingston, R. I., assignee by mesne assignments of Carlos W. Glover, Roxbury, Conn. Dated Oct. 14, 1856. Application for reissue received and filed April 6, 1868.

I claim as the invention of Carlos W. Glover, 1st, So constructing and operating the vibrating sickle driving mechanism of a harvesting machine, that such mechanism shall work through the driving wheel of the machine.

2d, The combination of the cogs, e, on the driving wheel, the pinion, f, upright shaft, C, and wheel, g, with the pinion, h, of the shaft, D, arranged substantially as and for the purpose specified.

3d, The combination with the driving wheel of the guide box carrying the sickle bar, in such manner that the bar may be adjusted for cutting at a greater or less hight, substantially as herein set forth.

41,746.—HARVESTER.—Mitchell, Vance & Co. (assignees of Edgar M. Smith), New York city. Dated Feb. 23, 1864. Application for reissue received and filed April 6, 1868.

We claim, 1st, In combination with the main driving and supporting wheels running loosely on their axles or journals, the main gear wheels, D, running loosely on the hubs of said drive wheels, and having a ratchet and pawl connection with each other, substantially in the manner and for the purpose herein described and represented.

2d, The arrangement of the two sets of plates and boxes on the opposite sides of the main frame, so that the cutting apparatus may be arranged on either side, as set forth.

3d, In combination with the two sets of plates arranged on opposite sides of the main frame, the curved bar or brace, F, extending from one to the other, so as to leave unobstructed space at I, for the free action of the rake as described.

4th, In combination with the loose and shifting main wheels and main cogged gears, the pinions, b, permanently arranged on the shaft, d, so that said loose and shifting wheels will, when on either side of the machine, mesh with said pinions as set forth, whichever end of the machine goes foremost.

5th, Hanging the reel blades to the reel shaft by means of the crossed arms and adjustable heads, hubs or sockets, for the purpose of enlarging or diminishing the circumference of the reel, substantially as described.

6th, The adjustable pulley plate and adjustable pulley thereon, for the purpose of taking up or letting out the reel belt, when the reel is lowered or raised on its support, substantially as described.

15,334.—CUTTING DEVICE FOR HARVESTERS.—John G. Perry, Kingston, R. I., assignee by mesne assignments of Carlos W. Glover, Roxbury, Conn. Dated July 15, 1856. Application for reissue received and filed April 6, 1868.

I claim as the invention of Carlos W. Glover, 1st, The combination with the guard fingers, of the leger blades or cutters, constructed with recesses in their upper sides, substantially as and for the purpose specified.

2d, So arranging the leger blades or cutters within the guard fingers that they may have a rocking or oscillating movement during the vibratory movement of the sickle, substantially as herein set forth.

3d, The attachment of the leger blades to the guard fingers by means of the projections, e, on the blades, extending into the cavities, f, in the fingers, substantially as and for the purpose specified.

46,846.—SCREW CUTTING MACHINE.—Charles Parker (assignee of Stephen W. Goodyear), Meriden, Conn. Dated March 14, 1865. Application for reissue received and filed April 8, 1868.

I claim as the invention of Stephen W. Goodyear, 1st, The combination of the rotating grooved cylinder with a fixed covering plate which bears horizontally upon the shanks of the blanks, but endwise against their heads, and with a movable covering plate, for the purposes and in the manner substantially as described, thus forming a conveying tool.

2d, The combination of the die or groove, i, constructed so as to hold a blank, in combination with a jaw forming together a vise in which the blank may be held firmly for such operation as nicking, or a journal in which the blank may be rotated for threading, etc., thus forming a holding tool.

3d, I claim the combination of a cylinder, such substantially as is herein described as having its fixed and movable covering plates, with the curved feeding slide trough, whereby without the use of the usual system of grippers, etc., the blank may be conveyed to the place where it is to be operated upon, as set forth.

4th, The employment of the semicircular groove, i, as a rest, while the cutter operates on a blank, when the said groove is constructed so as to act as a conveying tool.

64,554.—FRICTION PAWL.—Joseph Moore, San Francisco, Cal. Dated May 7, 1867. Application for reissue received and filed April 8, 1868.

I claim the employment upon the main or a countershaft of the windlass in hoisting apparatus, of a pulley which shall be on the one hand under the control of a brake, and on the other hand be connected with the shaft by the pawl and ratchet device or its equivalent, substantially in the manner and for the purposes set forth.

27,319.—BENDING SHEET METAL.—Orson W. Stow, Plantsville, Conn. Dated Feb. 28, 1860. Application for reissue received and filed April 9, 1868.

I claim, 1st, Making the folding bar commonly used in such machines in two parts, f and i, one part, i, being adjustable in respect to the folding plate, e, by means of set screws, n, or other equivalent means, so as to form a close or open lock, for joining two pieces of metal plate, or closing around a wire, substantially in the manner as described.

2d, I claim arranging the griping jaw, s, with the folding bar, f and i, in such a manner that on motion being given to the folding bar, f, on its axis, g, the griping jaw, s, is made to close on the folding plate, e, and at the same time carry along with it the folding bar, f, into such a position as will bring its axis, g, of motion nearly into a line with the edge of the folding plate, e, thereby placing the folding plate, f and i, in position to be turned over on to the folding plate, e, necessarily and simultaneously with the motion of the folding bar, f and i, on its axis, g, substantially in the manner as described.

3d, I claim the bed plate proper, a a', to which is secured the folding plate, e, in combination with the hinged frame, b, having journal boxes, d, and griping jaws, the folding bar, f and i, fixed or adjustable, and having journals, g, cams, o, arranged and operating together substantially in the manner as and for the purpose described.

4th, In a machine which uses but one folding bar, I claim the combination of the folding plate with the folding bar, when so constructed and operating together that the distance between their adjacent edges can be increased or diminished at pleasure, for the purpose of forming both open and close locks or bends in sheet metal.

60,151.—PRINTER'S GALLEY.—R. Hoe & Co. (assignees of Alex. T. De Puy), New York city. Dated Dec. 4, 1866. Application for reissue received and filed April 9, 1868.

I claim as the invention of Alex. T. De Puy, the combination with the wooden frame of a printer's galley, of a metallic lining, secured thereto by means of a groove or grooves, substantially as and for the purpose specified.

66,268.—PACKAGE FOR HOLDING AND SHIPPING LARD.—Charles L. Tucker, Chicago, Ill. Dated July 2, 1867. Application for reissue received and filed April 10, 1868.

DIVISION A.

I claim, 1st, The box herein described, when constructed without a lid or cover, rim, and with straight, even sides from top to bottom, substantially as and for the purposes specified.

2d, The application of gum arabic or its equivalent to lard packages for the purpose of making them non-absorbing, substantially as specified.

DIVISION B.

I claim, 1st, The application or use of a tin or lead foil, or foil paper, covering for lard packages, constructed of wood or paper, substantially as and for the purposes specified.

2d, The employment in packing lard of small wood or paper packages holding specific quantities, suitable for retailing in the original package, substantially as specified.

DIVISION C.

I claim the mode herein described of packing lard for transportation or storage, by first packing the lard in separate small packages of wood or paper and inclosing such small packages in an outer close fitting case, substantially as specified.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* *MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

792.—MACHINE FOR HULLING OR DECORTICATING COTTON OR OTHER SEED Alex. H. Simmonds, New York city. March 7, 1868.

806.—SCREW BOLTS AND NUTS FOR SECURING FISH PLATES, ETC.—Frederic Tudor, Boston, Mass. March 9, 1868.

754.—SPIRIT METER.—Robert Creuzbaur, New York city. March 4, 1868.

760.—MECHANISM FOR PREPARING AND SEWING SOLES UPON BOOTS AND SHOES.—Lyman R. Blake, Boston, Mass. March 5, 1868.

803.—MACHINE FOR MAKING NUTS.—Philippe Koch, New Haven, Conn March 7, 1868.

815.—PROCESS FOR MAKING ARTICLES FROM HARD RUBBER CAPABLE OF BEING MOLDED IN DIES, AND INLAYING AND ATTACHING METALLIC PLATES.—Wm. H. Halsey, Hoboken, N. J. March 9, 1868.

853.—BALLASTING VESSELS.—John B. Stoner, Leopold Mendelson, and Theodore Crommelin, New York city. March 12, 1868.

891.—MANUFACTURING ILLUMINATING GAS IN THE DISTILLATION OF HYDROCARBONS AND MAKING GASEOUS FUEL FOR HEATING.—Levi Stevens, Washington, D. C. March 16, 1868.

892.—TELEGRAPHIC APPARATUS.—Elisha W. Andrews and Edward A. Calahan, New York city. March 16, 1868.

895.—MACHINERY FOR COMBING COTTON, ETC.—Ira Dimock, Florence, Mass March 16, 1868.

944.—MACHINE FOR OVERCOMING RESISTANCE.—Henry F. Shaw, West Roxbury, Mass. March 19, 1868.

905.—SUBSTITUTE FOR HAIR STUFFING, AND MODE OF MANUFACTURING THE SAME FROM VEGETABLE FIBERS.—Nathan W. Blanchard, Dutch Flat Cal. March 17, 1868.

909.—PRODUCING STEEL AND CAST STEEL.—Alois Thoma, New York city March 17, 1868.

912.—COCHLEAMETER.—Samuel Curtiss, Jr., Williamsburg, N. Y. March 17, 1868.

920.—COVERING FOR FLOORS.—Wm. Howell, Jas. C. Fenn, and Chas. H. Day, Philadelphia, Pa. March 18, 1868.

931.—VENTILATING WINDOWS AND WINDOW BLINDS.—Wm. P. Hoffman San Francisco, Cal. March 19, 1868.

935.—MACHINERY FOR COMBING COTTON, ETC.—Milton D. Whipple, Cambridge, Mass. March 19, 1868.

947.—MACHINERY FOR OPENING AND CLEANING WOOL, ETC.—Chas. G. Sargent, Graniteville, Mass. March 20, 1868.

972.—METALLIC COTTON BALE TIE.—Jos. W. Branch and Joseph Crookes, St. Louis, Mo. March 23, 1868.

1,083.—MECHANISM FOR TAKING UP THE RECOIL OF HEAVY ORDNANCE.—Chas. S. Tyson, Prince George county, Md. March 30, 1868.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of their funds.

CITY SUBSCRIBERS.—The SCIENTIFIC AMERICAN will be delivered in every part of the city at $4 a year. Single copies for sale at all the News Stands in this city, Brooklyn, Jersey City, and Williamsburg, and by most of the News Dealers in the United States.

Advertisements.

The value of the SCIENTIFIC AMERICAN *as an advertising medium cannot be over-estimated. Its circulation is ten times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. We invite the attention of those who wish to make their business known to the annexed rates. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. If it is worth 25 cents per line to advertise in a paper of three thousand circulation, it is worth $2.50 per line to advertise in one of thirty thousand.*

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*
Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

HICKCOX'S PATENT MUCILAGE CAP.

T. N. HICKCOX & CO., Manufacturers of Stamped Brass Goods, Patent Brass Mucilage and Pomatum Caps, Bargare Checks, Brass Labels, etc. Steel Cutting and Stamping Dies, of any design required, Steel Letters, etc. Special Attention paid to Articles of New Manufacture and Patent Goods. Factory 240, 242, and 244 Wyckoff st., Brooklyn. Salesroom, 280 Pearl st., New York. 1*

NOTICE to TOOL MANUFACTURERS. Patent Right, for the United States, of the best Tube Borer in use. Has cut upwards of 50,000 holes for largest firm in New York. Will be sold cheap if applied for soon. Send for circulars.
1* T. L. WEBSTER, Brooklyn, N. Y.

FRED BALDWIN'S Patent Automatic Lathe turns every variety of Wood Work with astonishing rapidity. It is constructed upon the principle of the stationary hollow mandrel, with revolving chisels. A full-size Lathe on exhibition, and Rights for sale by
1* GEO. L. CANNON, 152 Broadway, New York.

GENERAL CANADIAN AGENCY For the sale of newly Patented American Inventions.
E. SIMAYS, Merchant, St. Andrews, (Arg'l.)
☞ N. B.—Samples, with Circular, only if prepaid, and none but inexpensive, useful, and popular articles, small hand-power machinery, etc., attended to. Reference, Rev. S. Rivett, St. Andrews. 1*

BY EXPRESS—C. O. D.—FOR $3—Fixtures (all iron) for opening, closing, and latching gates from team or saddle. May be attached to any gate, and will not be disarranged by frost, etc. Persons driving will find this improvement valuable. Also, rights to manufacture. E. ROTH & BROTHER,
New Oxford, Pa.

BOOK AGENTS WANTED, for Howland's LIFE OF GEN. GRANT, as a Soldier and a Statesman. An accurate history of his military and civil career. One large octavo vol. of 650 pages, finely illustrated. Agents will find this the book to sell at the present time. The largest commission given. We employ no General Agents and offer extra inducements to canvassers. Agents will see the advantage of dealing directly with the publishers. For circulars and terms, address
19 4 J. B. BURR & CO., Publishers, Hartford, Ct.

ARTIFICIAL STONE.—$10,000 Wanted. Manufactured Cheaper, and worked with greater facility than any other. T. HODGSON,
1* 7 Beach Place, Brooklyn, N. Y.

FOR IRON AND WOOD-WORKING Machinery, Steam Engines, Boilers, and Supplies, address HUTCHINSON & LAURENCE, 8 Dey st., N. Y.
19 4

NOW READY—THE PHRENOLOGICAL JOURNAL for May contains the Portraits and Biographical Sketches of Rev. Samuel J. May; Dr. Lindley, the Botanist; Rev. Jaboz Burns, of London; Mrs. Maryville, Poet; King Theodore, the Abyssinian; Handel; Haydn; Mozart; Beethoven; Baca; Mendelssohn; Rossini; Auber; besides papers on Mental Action; Duty, the Popular Idea; Unity in Division; Hard Times—Cause and Cure; What is the Motive? The Origin of Man; Diversities of Gifts; Moral of a Cash Account, etc., with engraved illustrations. 20 cents a number, or $3 a year. Address S. R. WELLS, Publisher, 389 Broadway, New York.
19 2

BROKERS' SALE of Rich and Valuable Goods, comprising a great variety of Valuable and Useful Articles for sale at $1 FOR EACH ARTICLE. For additional terms, and conditions of sale, send for circulars. The Stock consists of every variety of Dry Goods, Silver-Plated Ware, Albums, Carpetings, Boots and Shoes, etc. We commenced the sale of Goods on this plan in the fall of 1863. Our Goods are obtained by cash advances made on merchandise, or are purchased direct from the commission houses, manufacturers, and importers. We are selling goods at less prices for retail than are sold by any jobber in New York or Boston at wholesale. By offering such inducements to the public, we have increased our sales to the amount of about $1,000,000 a year, as we have made sworn returns to the U.S. Assessor of over one hundred thousand a month. Every exertion on our part will be made to give satisfaction to those who may favor us with their patronage. Address ANDREWS & CO., 104 and 106 Sudbury st., Boston, Mass.
19 4

ASHCROFT'S LOW WATER DETECTOR will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York.
12 12*

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York.
1 21*

MODELS, PATTERNS, EXPERIMENTAL, and other Machinery, Models for the Patent Office, built to order by HOLSKE MACHINE CO., Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN office.
14 tf

A PORTABLE ENGINE AND BOILER for sale Cheap, of best Material and Workmanship. Has been in use but three months. Will be sold very low. Call on or address JNO. ASHCROFT,
17 3 50 and 52 John st., New York.

GREAT ECONOMY IN
WATER POWER.
LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet for 1868 sent free on application. 13 4os* 16 4is*

Cheap, Useful, AND ***Elegant.***

IMPROVED BRONZE ALUMINUM HUNTING CASED WATCHES,
(the qualities and resemblance of this new metal are such, compared to Gold, that even judges are deceived), and ROSKOPF'S PATENTED PEOPLE'S WATCH.

The Improved Bronze Aluminum of which my watches are made, is a metal differing entirely from any ever offered to the public. It has seriously occupied the attention of scientific men, and has not only called forth the eulogium of the press, in consequence of its peculiar properties, but has also obtained a Gold Medal at the Paris Exposition and even been favorably noticed by rescript of his holiness, Pius IX., authorizing its use in the manufacturing of church goods.

The qualities of this metal are such that it is surpassed by none, if we except gold itself, and that only on account of the intrinsic value of the latter. Further details will be found in my circular, which will be sent, postpaid, on demand.

My Watches are of three sizes, all hunting cases, one small for Ladies or Lads, and two for Gents. The movements are well finished, and perfectly regulated. I can, therefore, warrant them excellent time-keepers. These goods being manufactured in my own factory, I am enabled to sell any of the above sizes at the extremely low price of $16.

A full assortment of all kinds of Chains always on hand. Goods sent by Express, C. O. D., with charges. Not responsible for money sent inclosed in letters. Address JULES D. HUGUENIN VUILLEMIN,
tf] No. 44 Nassau Street, New York.

SPICE CAN AND BLACKING BOX Riveting Machines (Improved), Foot or Power. Send for circulars and sample.
W. PAINTER & CO., Patentees,
15 13 45 Holliday, st., Baltimore.

ANDERSON'S PATENT MULEY SAW Hangings. The oscillating lower Muley and self-adjusting take upper Muley performs ¼ more work with ¼ less power than any other. COE & WILKES, Painesville, Ohio, sole manufacturers, except for the States of Maine and Pennsylvania. Send for circulars. 15 8

Springfield Brass Foundery, E Stebbins' Manufact'ng Co., Spring'd, Mass., furnish to order every variety of brass and composition castings, car boxes, letters, Babbitt metal, etc., of superior quality. Sample castings can be seen and orders left at Hayden, Gere & Co.'s, 84 Beekman st., N.Y., and Dalton & Ingersoll's, 17 & 19 Union st., Boston.
8 13*

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies.
12 12*] JOHN ASHCROFT, 50 John st., New York.

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip Saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse, 107 Liberty st., New York. 13 8*

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents.
12 tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

WROUGHT-Iron Pipe for Steam, Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y.
12 12*

For Sale Below Cost.

FIFTEEN PORTABLE STEAM ENGINES, Different Sizes; 8 Portable Flour Mills; 6 Lane's Patent Circular Saw Mills; 1 Muley Saw Mill, Anderson's Patent, and other Machinery. Send for printed description to Washington Iron Works, Newburgh, N. Y., or to WARD & STANTON,
57 Liberty st., New York.
Orders for Steam Engines, Boilers, and general machinery solicited. 16 4*

SCREW-BOLT CUTTERS.—Schwirtzer's Patent Bolt Cutters, with an equal amount of power and labor, will cut twice as many bolts as any other machine in use. For sale by the
SCHWEITZER PATENT BOLT CO.,
16 4* Green Point, Brooklyn, E. D., N. Y.

Agents Wanted.

FOR THE LIFE OF GEN. U. S. GRANT, By Hon. Henry C. Deming. The only work of the kind issued under the sanction and by the authority of Grant himself. The author is well known as one of the most brilliant writers and eloquent orators in the country. Agents will find this one of the most intensely interesting Biographies ever published in America, and will meet with a ready sale. For particulars, address
S. S. SCRANTON & CO., 126 Asylum st., Hartford, Ct.
16 4

PLATINUM. H. M. Raynor, 748 Broadway, N. Y.

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes.
12 tf] M. & T. SAULT COMPANY, New Haven, Conn.

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail.
BENEDICT BROS., Jewelers, 171 Broadway.
BENEDICT BROS., up town, 691 Broadway.
BENEDICT BROS., Brooklyn, 254 Fulton st. 1 tf

BOILER FELTING SAVES TWENTY-five per cent of Fuel. JOHN ASHCROFT,
12 12*] 50 John st., New York.

EMPLOYMENT.—$15 to $30 a day guaranteed. Male or Female Agents wanted in every town—descriptive circulars free. Address
15 13—N.] JAMES C. RAND & CO., Biddeford, Me.

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.
16 4

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line. Improved Lathes for making large valves etc. Address Exeter Machine Works, Exeter, N. H. 13 tf

SHAW'S CHEMICAL ELECTRO SILVER-PLATING FLUID makes worn-out plated-ware as good as new. Samples sent by mail on receipt of 25 cents to pay for packing and postage. Address
J. SHAW, Chemist,
30 Elm st., Bridgeport, Conn. Agents wanted everywhere.
18 4

WATER-WHEEL GOVERNORS,—First-Class Line Shafting and Pulleys. Address
18 tf GREENLEAF & CO., Indianapolis, Ind.

ENGINE WANTED IMMEDIATELY, of three to four horse-power. Those having new or good second-hand for sale, please address
H. S. AKINS, Speedsville,
18 2* Tompkins Co., N. Y., giving particulars and price.

FUEL Economized and Power Increased by Carvalho's Pat. Steam Super-Heater, easily attached to boilers, gives perfectly DRY steam, remedies "priming." Address H. W. BULKLEY, Gen'l Ag't, 70 Broadway, N.Y.
9 13*

WOODWORTH PLANERS A SPECIALTY—From new patterns of the most approved style and workmanship. Wood-working Machinery generally. Nos. 24 and 26 Central, corner Union street, Worcester, Mass.
16 13* WITHERBY, RUGG & RICHARDSON.

OIL! OIL!! OIL!!!

FIRST PREMIUM.....PARIS, 1867
Grand Silver Medal and Diploma!
WORLD'S FAIR—London, 1862.
TWO PRIZE MEDALS AWARDED
PEASE'S IMPROVED OILS!
Engine, Signal, Lard, and Premium Petroleum is the Best Made for
Railroads, Steamers, and for Machinery and Burning.
F. S. PEASE, Oil Manufacturer,
Nos. 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world.
7 tf

PORTABLE STEAM ENGINES, COMBINING the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address
J. C. HOADLEY & CO., Lawrence, Mass. 2 tf

WHEELER & WILSON, 625 BROADway, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 2 1*

YOU CAN SOLDER your own tin ware without a soldering iron by buying one bottle of Wilson's Prepared Solder. Samples sent on receipt of 25 cents, with price list. Agents wanted everywhere. Direct to WILSON & CO., 19 Lindall st., Boston. 12 tf-D

FARMER'S THERMO-ELECTRIC BATTERY. W. H. Remington, Manufacturer and Agent. Manufactory at Cohasset, Mass. Office and salesroom, No. 109 Court street, Boston, Mass.
This Battery does away entirely with acids, quicksilver, or liquids of any kind, the electrical current being generated by the action of heat, a simple gas burner being all that is required to put this battery into action. It is clean, constant, and requires no care, performing the work of any acid battery. 15 tf

PATENT SHINGLE, STAVE, AND Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and Heading Jointers, Heading Rounders and Planers, Equalizing and Cut-off Saws. Send for Illustrated List.
FULLER & FORD,
6 tf] and 284 Madison street, Chicago, Ill.

LATHE CHUCKS—HORTON'S PATENT—from 4 to 36 inches. Also for car wheels. Address E. HORTON & SON, Windsor Locks, Conn. 18 tf

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. 16 12*

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's Supplies, of all kinds, at
1 24* M. T. DAVIDSON & CO.'S, 84 John st., N. Y.

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 12 12*

POWER PUNCHES AND SHEARS, Straightening Machines, Vertical Drills, etc. Address GREENLEAF & CO. Indianapolis Ind. 7 13* tf

PHOENIX IRON WORKS—
Established 1854.
GEO. S. LINCOLN & CO.,
Iron Founders and Manufacturers of Machinists and Gun Tools, 54 to 60 Arch street, Hartford, Conn.
Samples may be seen in our Warerooms. 14 tf

Brick Machine.

LAFLER'S NEW IRON CLAD has more advantages combined in one machine than any other ever invented. It makes common brick of very superior quality. By a slight change, press brick are made without repressing. With Lafler's Patent Mold, beautiful stock brick are made. This machine was awarded first premium at the N. Y. State Fair, 1867, for making Front Bricks. Examining Committee awarded special report, indorsing this machine. For descriptive circular address
J. A. LAFLER & CO.,
15 tf eow Albion, Orleans county, N. Y.

PRICE LIST OF
P.S. STUBS' Files & Tools. Also, U.S. Standard Steel Scales, Squares, etc. Steel letters & Figures. Sent to any address.
GOODNOW & WIGHTMAN, 23 Cornhill, Boston, Mass.
13 eow tf

LE COUNT'S PATENT HOLLOW LATHE DOG is Light, Thin, and of at least Double the Strength of others. They have Good Steel Screws, well fitted and Hardened. Prices
From ⅜ to 2 inches, 8 sizes, inc.....$ 8 00
do. ⅜ to 4 do. 12 " " 17 50
Sent by Express to any address. For circular send to
C. W. LE COUNT,
South Norwalk, Conn. 13 eowtf

HYDRAULIC Jacks and Punches, Improved. Manufactured by E. LYON, 470 Grand st., New York. Send for a circular. 1 eow13*

TUBE WELLS.—Patented Jan. 21, 1868. The LATEST and BEST.—Warranted to operate where any other will work, and in hundreds of places where others will not. Territory sold by Towns, Counties, or States, for cash or saleable property. Township Rights $25 each, which is the profit on one well of 20 feet. Individual Rights $5 each. Address
11 7 eow* W. T. HORNER, Buffalo, N. Y.

WOOD-WORKING MACHINERY, The SUBSCRIBER is the New York Agent for all the Manufacturers, and sells at their prices. S. C. HILLS, 12 Platt st. 3 tf o

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

CAMDEN TOOL AND TUBE WORKS CO., Camden, N. J., Manufacture Wrought Iron Pipe, and all the most Improved Tools for Screwing, Cutting, and Fitting Pipe. 19 13

ESSAYS for Young Men on the Errors and Abuses incident to Youth and Early Manhood, with the humane view of treatment and cure, sent by mail free of charge. Address Howard Association, box P, Phila. Pa.
18 13

Morris, Wheeler & Co.,
1608 Market st., Philadelphia, Manufacturers & Dealers in
IRON, STEEL, AND NAILS,
Boiler and Plate Iron, Rivets, etc.
New York Office, 24 Cliff st. Works at Pottstown, Pa. 17 13

TO BUILDERS, CAR COMPANIES, and others, Jenkins' Patent Self Sash Hanging, for Dwellings, Railroad Cars, etc. State and County Rights for sale. Agents wanted. C. H. JENKINS & CO.,
17 4* No. 9½ N. 10th st., Philadelphia, Pa.

Banks, Dinsmore & Co.
Manufacturers of Standard Scales of all Varieties,
9th st., near Coates, Philadelphia. 17 13

SHAW'S "PARAGON"
LATHE TOOL

Is a tough Steel Stock, arranged for interchangeable Cutters, made of Diamond Cast Steel. See illustration in Scientific American of April 4th. Each cutter is shaped and tempered, and merely requires grinding, thus saving all dressing at the forge, and time in waiting. The Thread Cutters are milled to the proper angle, which is maintained until it is used up. Each tool will save its cost in men's time in a few days, and frequently in 24 hours of steady work. After a trial no one will be without them. Size No. 1, is ⅝x1¼, price $3, complete. Extra cutters 25 cents. Manufactured by Patentee,
PHILIP S. JUSTICE,
No. 42 Cliff st., New York. No. 14 N. 5th st., Philadelphia.
16 4

ENGINE LATHES—A Specialty.—Send for circular. HARRINGTON & HASKINS,
15 4 Cor. 15th st. and Penn. ave. Philadelphia.

SLIDE LATHES, Iron Planers, Upright Drills, Bolt Cutters, Compound Planers, Universal Chucks, Gear Cutters, etc., at reduced prices. Address
15 13 CHAS. H. SMITH, 135 North 3d st., Philadelphia.

ALBRECHT, RIEKES & SCHMIDT.

MANUFACTURERS OF 1ST-CLASS PIANO FORTES
No. 619 Arch street,
15 13 Philadelphia, Pa.

MERRICK & SONS,
Southwark Foundery,
PHILADELPHIA, Pa.,

MANUFACTURE Steam Hammers of Nasmyth and Davy styles.
Apparatus for Making Sugar from Beet Root & Cane Juice, & for Refineries working Sugar & Molasses
Gas Machinery of every description.
Oscillating Engines having
SLIDE VALVES worked by ECCENTRIC.
Patterns on hand of sizes—8x10, 10x12, 14x14, 18x12.
N. B.—Designers and constructors of the machinery for the
Forest City Sugar Refining Co., Portland, Me.
C. Y. Morriss Sugar Refinery, Richmond, Va.
Southwark Sugar Refinery, Philadelphia, Pa.
Grocers' Sugar House (Molasses), do. 17 eow tf

TAWS AND HARTMAN.—All kinds of Brass Cocks, Gages, Valves, etc. Special fittings for Blast Furnaces and Rolling Mills, Machine Jobbing, and Drafting. Ross & Holland pat. Tallow Cups. 1237 North Front st., Philadelphia, Pa. 15 7eow

KENSINGTON IRON WORKS.—Stationary and Portable Engines of any required size made to order. Also, Locomotive, Fine, Cylinder, & Marine Boilers. Tug Boats and Propeller Yachts of required length, breadth of beam, and Power.
15 8 A. L. ARCHAMBAULT, Philadelphia, Pa.

FIRE-PROOF CONSTRUCTION.—Gilbert's Corrugated "Iron Ceiling," for fire-proof buildings. Office No. 429 Walnut street, Philadelphia.
Wrought Iron Beams of all sizes. All kinds of Corrugated Iron. Fire-proof Buildings constructed.
14 13 JOS. GILBERT, Superintendent.

Cedar Vats, Tanks, and Reservoirs,

For Brewers, Distillers, Dyers, Chemists, Manufacturers etc., Public and Private Buildings, etc., etc.
GEO. J. BURKHARDT & CO.,
8 13*] Buttonwood, below Broad st., Philadelphia, Pa.

Bridesburg Manf'g Co.,
Office No. 65 North Front Street,
PHILADELPHIA, Pa.,
Manufacture all kinds of Cotton and Woolen Machinery including their new
Self-Acting Mules and Looms,
Of the most approved style. Plans drawn and estimates furnished for factories of any size. Shafting and mill gearing made to order. 7 13* tf

Zur Beachtung für Deutsche Erfinder.

Nach dem neuen Patent-Gesetze der Vereinigten Staaten, können Deutsche, sowie Bürger aller Länder, mit einer einzigen Ausnahme, Patente zu denselben Bedingungen erlangen, wie Bürger der Ver. Staaten.

Erkundigungen über die, zur Erlangung von Patenten nöthigen Schritte, können in deutscher Sprache schriftlich an uns gerichtet werden und Erfinder, welche persönlich nach unserer Office kommen, werden von Deutschen prompt bedient werden.

Die Patentgesetze der Vereinigten Staaten,

nebst den Regeln und der Geschäftsordnung der Patentoffice, und Anleitungen für die Erfinder um sich Patente zu sichern, sind in Buch-Format von uns in deutscher Sprache herausgegeben, und werden gratis an alle versandt, welche darum mündlich oder schriftlich einkommen.

Man adressire

MUNN & CO.
37 Park Row, New York.

PATENTS

The First Inquiry that presents itself to one who has made any improvement or discovery is: "Can I obtain a Patent?" A *positive* answer can only be had by presenting a complete application for a Patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and all Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After a season of great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning.

If the parties consulted are honorable men, the inventor may safely confide his ideas to them: they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, have been actively engaged in the business of obtaining patents for over twenty years—*nearly a quarter of a century*. Over Fifty thousands inventors have had benefit from our counsels. More than one third of all patents granted are obtained by this firm.

Those who have made inventions and desire to consult with us, are cordially invited to do so. We shall be happy to see them in person, at our office, or to advise them by letter. In all cases they may expect from us an *honest opinion*. For such consultations, opinion, and advice, we *make no charge*. A pen-and-ink sketch, and a description of the invention should be sent, together with stamps for return postage. Write plainly, do not use pencil nor pale ink; be brief.

All business committed to our care, and all consultations, are kept by us *secret and strictly confidential*. Address MUNN & CO., 37 Park Row, New York.

Preliminary Examination.—In order to obtain a Preliminary Examination, make out a written description of the invention in your own words, and a rough pencil or pen-and-ink sketch. Send these with the fee of $5 by mail, addressed to MUNN & CO., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. The Preliminary Examination consists of a special search, which we make with great care, among the models and patents at Washington to ascertain whether the improvement presented is patentable.

In Order to Apply for a Patent, the law requires that a model shall be furnished, not over a foot in any dimensions,—smaller, if possible. Send the model by express, pre-paid, addressed to Munn & Co., 37 Park Row, N. Y., together with a description of its operation and merits. On receipt thereof we will examine the invention carefully and advise the party as to its patentability, free of charge.

The model should be neatly made of any suitable materials, strongly fastened, without glue, and neatly painted. The name of the inventor should be engraved or painted upon it. When the invention consists of an improvement upon some other machine, a full working model of the whole machine will not be necessary. But the model must be sufficiently perfect to show, with clearness, the nature and operation of the improvement.

New medicines or medical compounds, and useful mixtures of all kinds, are patentable.

When the invention consists of a medicine or compound, or a new article of manufacture, or a new composition, samples of the article must be furnished, neatly put up. Also, send us a full statement of the ingredients, proportions mode of preparation, uses, and merits.

Reissues.—A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when by reason of an insufficient or defective specification the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake without any fraudulent or deceptive intention.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application, by paying the required fee in each case, and complying with the other requirements of the law, as in original applications.

Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts. Address MUNN & CO., 37 Park Row, for full particulars.

Interferences.—When each of two or more persons claims to be the first inventor of the same thing, an "Interference" is declared between them, and a trial is had before the Commissioner. Nor does the fact that one of the parties has already obtained a patent prevent such an interference; for, although the Commissioner has no power to cancel a patent already issued, he may, if he finds that another person was the prior inventor, give him also a patent, and thus place them on an equal footing before the courts and the public

Caveats.—A Caveat gives a limited but immediate protection, and is particularly useful where the invention is not fully completed, or the model is not ready, or further time is wanted for experiment or study. After a Caveat has been filed, the Patent Office will not issue a patent for the same invention to any other person, without giving notice to the Caveator, who is then allowed three months time to file in an application for a patent. A Caveat, to be of any value, should contain a clear and concise description of the invention, so far as it has been completed, illustrated by drawings when the object admits. In order to file a Caveat the inventor needs only to send us a letter containing a sketch of the invention, with a description in his own words. Address MUNN & CO., 37 Park Row, N. Y.

Additions can be made to Caveats at any time. A Caveat runs one year, and can be renewed on payment of $10 a year for as long a period as desired.

Quick Applications.—When, from any reason parties are desirous of applying for Patents or Caveats, in BE AT HASTE, without a moment's loss of time, they have only to write or telegraph us specially to that effect, and we will make special exertions for them. We can prepare and mail the necessary papers at less than an hour's notice, if required.

Foreign Patents.—American Inventors should bear in mind that, as a general rule, any invention that is valuable to the patentee in this country is worth equally as much in England and some other foreign countries. Five Patents—American, English, French, Belgian, and Prussian—will secure an inventor exclusive monopoly to his discovery among ONE HUNDRED AND THIRTY MILLIONS of the most intelligent people in the world. The facilities of business and steam communication are such that patents can be obtained abroad by our citizens almost as easily as at home. The majority of all patents taken out by Americans in foreign countries are obtained through the SCIENTIFIC AMERICAN PATENT AGENCY. A Circular containing further information and a Synopsis of the Patent Laws of various countries will be furnished on application to Messrs. MUNN & Co.

For Instructions concerning Foreign Patents, Reissues, Interferences, Hints on Selling Patents, Rules and Proceedings at the Patent Office, the Patent Laws, etc., see our Instruction Book. Sent free by mail on application. Those who receive more than one copy thereof will oblige by presenting them to their friends.

Address all communications to

MUNN & CO.,

No. 37 Park Row, New York City.
Office in Washington, Cor. F and 7th streets.

Patents are Granted for Seventeen Years, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application

PATENT CLAIMS.—Persons desiring the claim of any invention, patented within thirty years, can obtain a copy by addressing a note to this office, giving name of patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO. Patent Solicitors, No. 37 Park Row New Yo

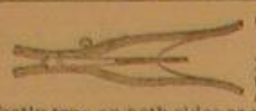
R. HOE & CO.'S
NEW PATENT WARRANTED
SAWS WITH INSERTED TEETH.
CIRCULARS, WITH ENGRAVINGS, SENT ON APPLICATION.

31 Gold Street, New York. 19 tf os

Advertisements.

A limited number of advertisements will be admitted on this page at the rate of $1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

PATTERN LETTERS to put on Patterns for Castings, etc. KNIGHT BROS., Seneca Falls, N.Y. 19 2os*



TO CARPENTERS, Manufacturers, etc., this Patent Saw Set is a most valuable tool. It sets all kinds of saws with great ease, perfectly true on both sides as you go over it. Circular saws need not be taken out of the mandrel. All sets made of steel and warranted. Liberal discount to Agents. For terms, etc., address NORTON, LIBBY, & Co., Manuf'rs and Proprietors, 339 Mill st., Poughkeepsie, N.Y. 19 1os

ENGINES—Portable, Stationary, and Upright, of best makers, in good order, for Saw Mills, Thrashing, etc., at ¼ the original cost. Also, Saw Mills complete. EUG. LIST, 1os* Parkersburg, W. Va.

WIRE ROPE.
Manufactured by
JOHN A. ROEBLING
Trenton, N. J.

FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 17 5*os

Pressure Blowers

OF ALL SIZES, for purposes where a blast is required. For particulars and circulars, address B. F. STURTEVANT, No. 72 Sudbury st., Boston, Mass. 17 ostf

Band Saws and Files.

FRENCH BAND SAW MACHINES and SAWS—For Sawing Logs and Resilitting. Also, for Light and Heavy work. G. GUEUTAL, 1*os 39 West Fourth st., New York.

EMERSON'S PATENT MOVABLE TOOTHED CIRCULAR SAWS SUPERIOR TO ALL OTHERS. FOR DESCRIPTIVE PAMPHLET ADDRESS THE AMERICAN SAW CO. N.Y.

EMERSON'S PATENT PERFORATED CIRCULAR & LONG SAWS REQUIRE NO CUMMING. FOR DESCRIPTIVE PAMPHLET ADDRESS AMERICAN SAW CO. N.Y.

Factory, Trenton, N. J. Office, No. 2, Jacob st., N. Y. 14 tf

FREE. Our New Catalogue of Improved STENCIL DIES. More than $200 A MONTH is being made with them S. M. SPENCER & CO., Brattleboro, Vt. 6ostf

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven. 5os tf

Ready Roofing

READY ROOFING.—The first customer in each place can buy 1000 feet of Roofing at half price—$25. Samples and circulars sent by mail. Ready Roofing Co., 81 Maiden Lane, New York. 12 tf os

FOR SALE—Rights to Manufacture the Simplest and Best Cider Mill yet invented. It has carried off the first prize wherever exhibited. For information address H. SELLS, Vienna, C. W., 18 2* Or, John Alexander, Shelby, Ohio.

FABRICATION OF VINEGAR.—Prof. H. DUSSAUCE, Chemist, is ready to furnish the most recent processes to manufacture vinegar by the slow and quick methods, with and without alcohol, directly from corn or other grains. Address, New Lebanon, N. Y. 18 2*

CANVASSERS wanted for the combined stamp attacher, letter sealer, inkstand, pen rack and wiper, calendar check and envelope case. Expressed, prepaid, for $5. Circulars free. Address 17 4* J. H. MARTIN, Hartford, N. Y.

DIRECT-ACTING STEAM PUMPS,—and Boiler Feeders, in lieu of Injectors. Address, for circulars, the Sole Manufacturers, COPE & CO., 17 6 No. 118 East 2d st., Cincinnati, Ohio.

IRON & WOOD WORKING MACHINERY

TURBINE WATER WHEELS.
LUCIUS W. POND,
98 Liberty st., N. Y., and Worcester, Mass. 18 tf

JUST PUBLISHED—THE INVENTOR'S and MECHANIC'S GUIDE.—A new book upon Mechanics, Patents, and New Inventions. Containing the U. S. Patent Laws, Rules and Directions for doing business at the Patent Office; 112 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to sell Patents: Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO. 37 Park Row, N. Y.

SETS, VOLUMES AND NUMBERS. Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New Series) can be supplied by addressing A. B. C., Box No. 773, care of MUNN & CO., New York.

CAN I OBTAIN A PATENT?—For Advice and instructions address MUNN & CO., 37 Park Row New York for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN $3 a year $9,000 Patent cases have been prepared by M. & Co.

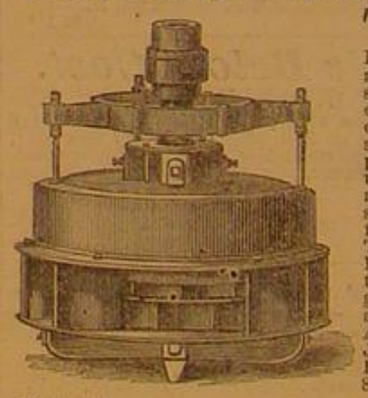
CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, Instruction, Reports, etc., on the useful arts. 1 tf

Reynolds' TURBINE WATER WHEELS

And all kinds of MILL MACHINERY. Send for Illustrated Pamphlet. GEORGE TALLCOT, 14 13* os 96 Liberty st., New York.

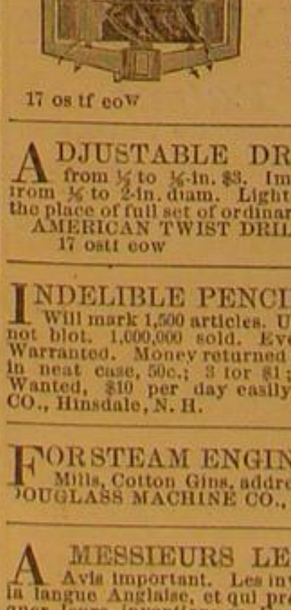
WHEATON'S OINTMENT cures the Itch WHEATON'S OINTMENT will cure Salt Rheum. WHEATON'S OINTMENT cures Old Sores. WHEATON'S OINTMENT cures all diseases of the Skin. Price 50 cents;—by mail 60 cents. All Druggists sell it. WEEKS & POTTER, Boston, Proprietors. 2 tf os

WATER WHEELS.



THE DUPLEX TURBINE.—Especially adapted to variable streams, for large or small quantities of water. Gives the same proportion of power to the water used with a partial as with a full gate, something never before accomplished. The smaller wheels kept on hand ready to ship. All wheels guaranteed. Reliable men wanted as Agents. J. E. STEVENSON, Hydraulic Engineer 83 Liberty st., N. Y. 17 os eow

BODINE'S JONVAL TURBINE WATER Wheel, combining great economy in the use of water, simplicity, durability, and general adaptation to all positions in which water can be used as a motive power. We are prepared to furnish & warrant the same to give more power than any overshot or other turbine wheel made using the same amount of water. Agents wanted. Send for descriptive circular. BODINE & CO., Manuf's, Mount Morris, N. York, and Westfield, Mass.



17 os tf eow

ADJUSTABLE DRILL CHUCK—holds from ⅛ to ⅜-in. $3. Improved Lathe Dog, carries from ⅛ to 2-in. diam. Light and strong—will take the the place of full set of ordinary dogs. Price $1. Address AMERICAN TWIST DRILL CO., Woonsocket, R. I. 17 ostf eow

INDELIBLE PENCIL, for Marking Linen. Will mark 1,500 articles. Used like a lead pencil. Will not blot. 1,000,000 sold. Every housekeeper wants it. Warranted. Money returned if not satisfactory. Sample in neat case, 50c.; 3 for $1; 1 doz. for $3 50. Agents Wanted, $10 per day easily made. Address PENCIL CO., Hinsdale, N. H. 18 3

FOR STEAM ENGINES, BOILERS, SAW Mills, Cotton Gins, address the ALBERTSON AND DOUGLASS MACHINE CO., New London, Conn. 15 tf

A MESSIEURS LES INVENTEURS—Avis important. Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications serons reçus en confidence. MUNN & CO., Scientific American Office, No. 37 Park Row New York

Philadelphia Advertisements.

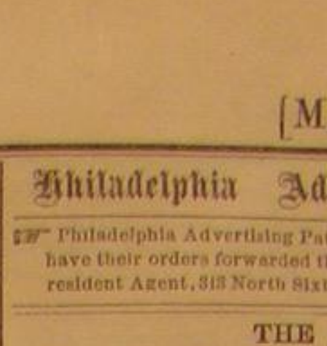
☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

THE
HARRISON BOILER
HAS ABSOLUTE SAFETY!
HAS GREAT ECONOMY IN FUEL
HAS DURABILITY AND FACILITY OF REPAIR.

Hundreds of these boilers have now been in use for years, giving perfect satisfaction. For descriptive circular and price apply to

JOHN A. COLEMAN, Agent, 55 Kilby street, Boston, Mass.
J. B. HYDE, Agent, Office No. 9, at 119 Broadway, New York, or to
THE HARRISON BOILER WORKS, 9 13*] Gray's Ferry Road, Philadelphia, Pa.

TO INVENTORS.—Any Person having an invention or patent, and lacks money, can obtain assistance, if approved of, by applying to or addressing with particulars, H. J. FOX, 18 5*os 221 South 5th st., Philadelphia, Pa.



BROOK'S PAT. PARAFFINE INSULATOR WORKS, No. 22 South 21st street, Philadelphia. Wire insulated with this insulator, can, like the conductor in a well-insulated sub-marine cable, or the Leyden Jar, be charged and discharged, in rain and fog, the damp air itself, which has hitherto by some been supposed to conduct, serving as the dielectric, 18 2*os

Industrial Works.

MACHINISTS' TOOLS AND EQUIPments for Railroad, Iron Ship Building, and Gun Shops.
STEAM HAMMERS,
TURN TABLES, Shafting, Bolt Cutters, Cotter and Key-Seating Machines, Cranes, Cupolas, etc.
9 13os*] BEMENT & DOUGHERTY, Philadelphia, Pa

DRAWING INSTRUMENTS.—A Manual of 112 pages describing all Mathematical Instruments and Drawing Materials, their use, and how to keep in order. Sent free on application by JAS. W. QUEEN & CO., Mathem'l Inst't makers, 924 Chestnut st., Philadelphia. 11 16*os

WOODWARD'S COUNTRY HOMES: 150 designs, $1 50 postpaid. GEO. E. WOODWARD, 191 Broadway, N.Y. Send stamp for catalogue of books on Architecture. 18 tfos

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY. Works, Paterson, N. J.; Warerooms, 4 Dey st., N. Y., Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Rope & Oakum Machinery; Snow's & Judson's Governors; Wright's Patent Variable Cut-off & other Engines. 9 tf

FRENCH BURR MILLSTONES, BOLTING CLOTHS, Of the very best qualities imported, Supplied Cheaper than any other house in the country by GEO. TALLCOT, 14 13* 96 Liberty street, New York.

1868.

Scientific American.

THE
BEST PAPER IN THE WORLD.
Published for Nearly
A QUARTER OF A CENTURY.

This **Splendid Newspaper**, greatly enlarged and improved, is one of the most reliable, useful, and interesting journals ever published. Every number is **beautifully printed and elegantly illustrated** with several **Original Engravings**, representing New Inventions, Novelties in Mechanics, Agriculture, Chemistry, Photography, Manufactures, Engineering, Science and Art.

Farmers, Mechanics, Inventors, Engineers, Chemists, Manufacturers, people in every profession of life, will find the **SCIENTIFIC AMERICAN** to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the value of which is beyond pecuniary estimate. All patents granted, with the claims, published weekly.

Every Public or Private library should have the work bound and preserved for reference.

The yearly numbers of the **SCIENTIFIC AMERICAN** make a splendid volume of nearly one thousand quarto pages, equivalent to nearly **four thousand ordinary book pages.** A New Volume commences January 1, 1868. Published Weekly. **Terms:** One Year, **$3**; Half-Year, **$1 50**; Clubs of Ten Copies for One Year, **$25**; Specimen Copies sent gratis.

Address

MUNN & CO.,
37 Park Row, New York.

☞ The Publishers of the **Scientific American,** in connection with the publication of the paper, have acted as **Solicitors of Patents** for **twenty-two years. Thirty Thousand** Applications for Patents have been made through their Agency. More than **One Hundred Thousand Inventors** have sought the counsel of the Proprietors of the **SCIENTIFIC AMERICAN** concerning their inventions. Consultations and advice to inventors, by mail, free. Pamphlets concerning Patent Laws of all Countries, free.

☞ **A Handsome Bound Volume,** containing **150** Mechanical Engravings, and the United States Census by Counties, with Hints and Receipts for Mechanics, mailed on receipt of 25c.