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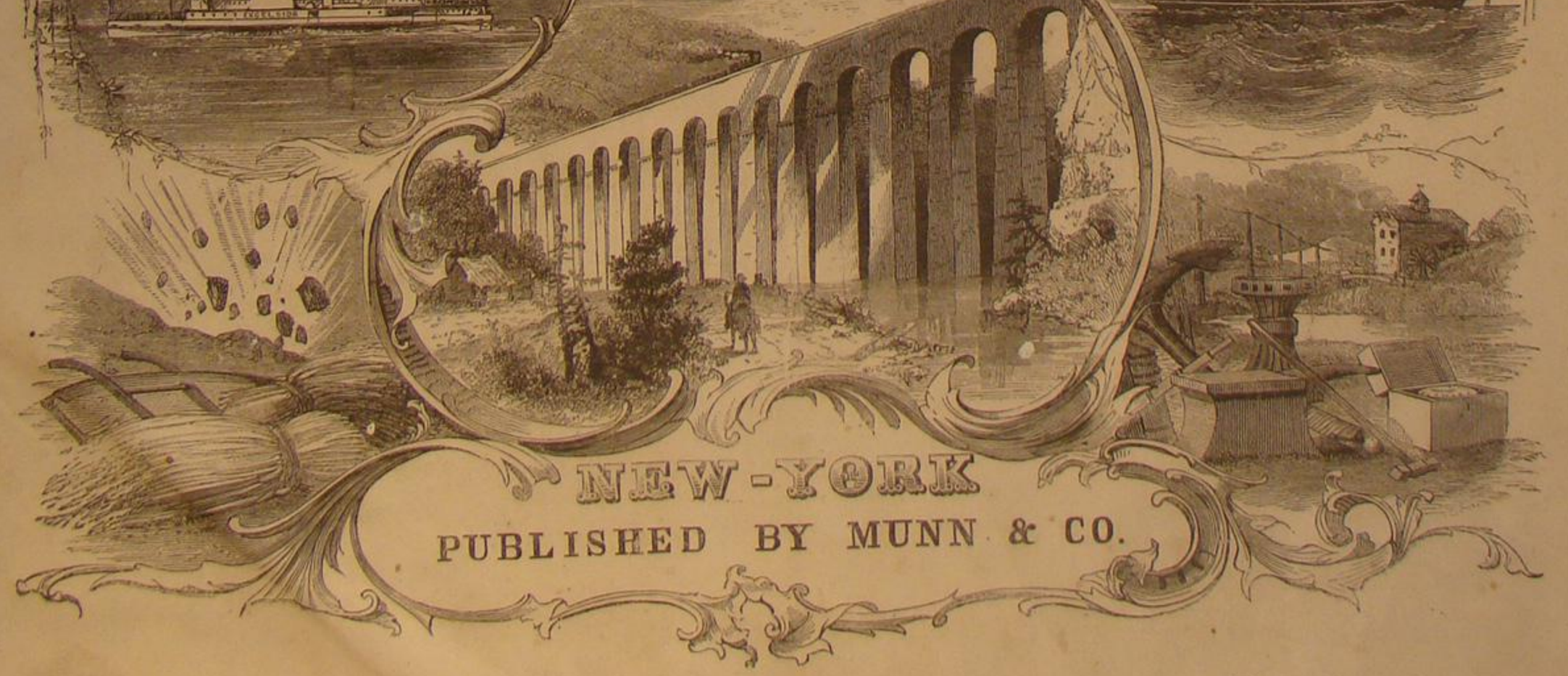
Scientific American



AN ILLUSTRATED

JOURNAL OF ART, SCIENCE & INDUSTRY

Vol. XVII.



NEW-YORK

PUBLISHED BY MUNN & CO.

110614

SCIENTIFIC AMERICAN

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

Vol. XVII.—No. 1. [NEW SERIES.] NEW YORK, JULY 6, 1867. $3 per Annum [IN ADVANCE.]

Improved Portable Photographic Apparatus.

The difficulty experienced by photographers in carrying, for outdoor work, a sufficient number of sensitized plates without exposure, has led the inventor to the contrivance of the apparatus represented in the annexed engravings. It seems to combine portability, convenience, and ease of manipulation.

Fig. 1 is a perspective view of the apparatus. A is the camera proper, and B the box for carrying the prepared plates, the two forming one compact contrivance which may be carried by the cords affixed to each side of the box. In Fig. 2 the apparatus is shown in longitudinal section. C represents the eye holes, which may becovered or uncovered by the diaphragm, D, turned by the thumb-knob, E. F is the slide for the lenses. At G, Fig. 3, is the ground glass plate on which the object is focused. This plate is movable for a purpose to be stated hereafter. The box or frame, B, on the top of the camera has on its sides a series of perpendicular grooves for holding the prepared plates, each one of which is secured in position by a thin strip of metal, like a spring, compressed against the edge of the plate by the screws, the heads of which are seen at the side of the holder in Fig. 1. Each one of these screws holds a plate ready prepared, and the only limit to the number is the size of the apparatus. Across the lid of the camera is a slit sufficiently wide to admit the passage of one of the sensitized plates from the holder to the camera. When it is desired to bring one of these plates into position the focusing plate, G, is retired from the snugs or supports in the camera, enough to allow the prepared plate to drop between the supports and the ground glass. This is done by means of a lever, H, which pulls back the spring, I, Fig. 2, and with it the ground glass plate. When the pressure is removed from the lever, the spring forces the plate, G, against the sensitive plate and holds it firmly in place until the image is formed.

In order to bring the prepared plates into position to drop into the camera, the holder, B, is made to slide upon the lid of the camera and is held to any point by the spring catches, J, Fig. 1, which engage with notches in metal strips on the edges of the lid, which are numbered, as in the engraving, to correspond with similar numbers on the heads of the screws in the side of the holder. The catches, J, are disengaged from the notches by the wedge shaped levers, K, so that the plate holder may be moved one notch. When the image has been fixed on the plate, the plate is returned to its compartment in the holder by simply reversing the apparatus, and retained by setting up the screw.

Practical photographers who practice out-door business as well as those confined to studio work will at once recognize the advantages of this combination. Application for a patent is pending through the Scientific American Patent Agency by David H. Houston of Cambria, Columbia Co., Wis., who will furnish any additional information desired.

Fig. 1.

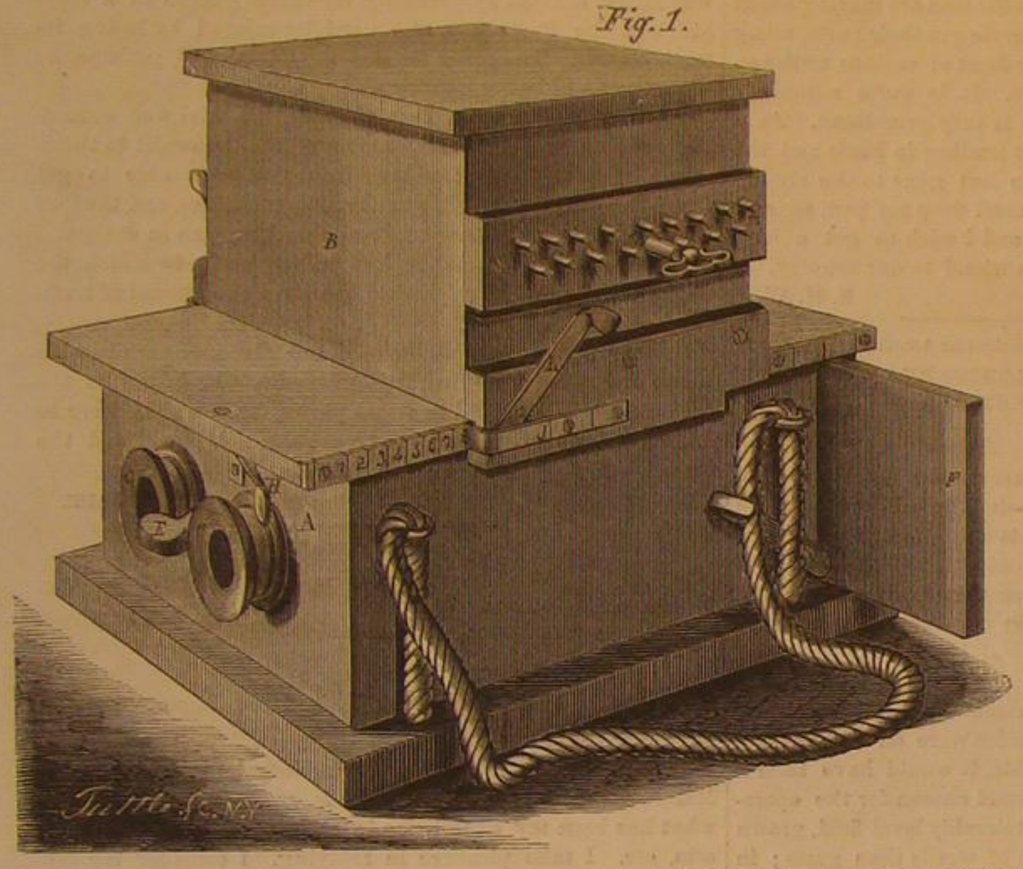
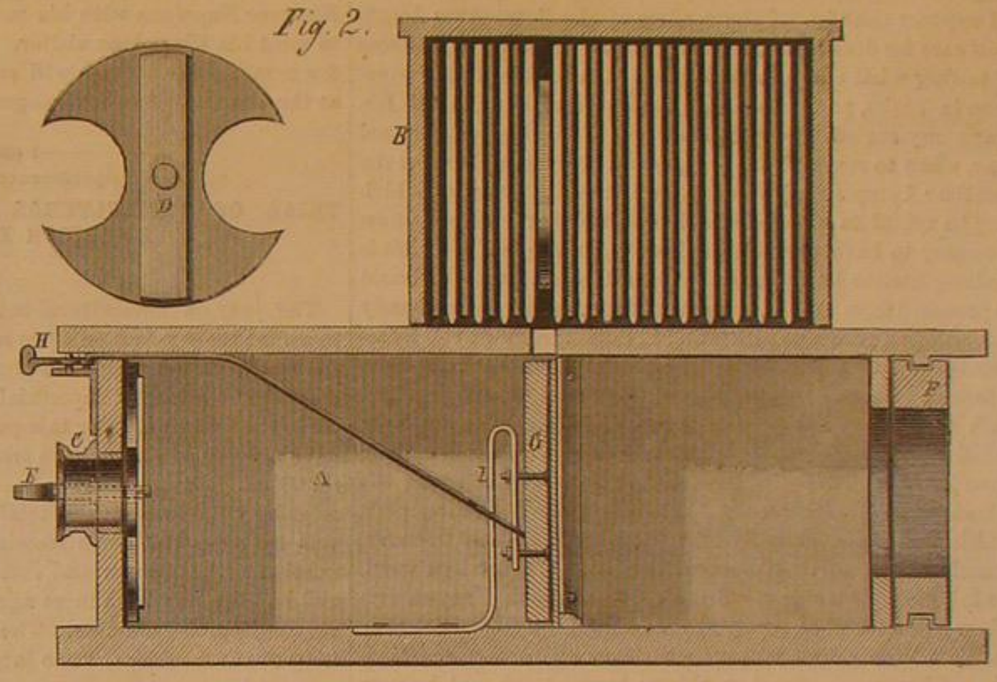


Fig. 2.



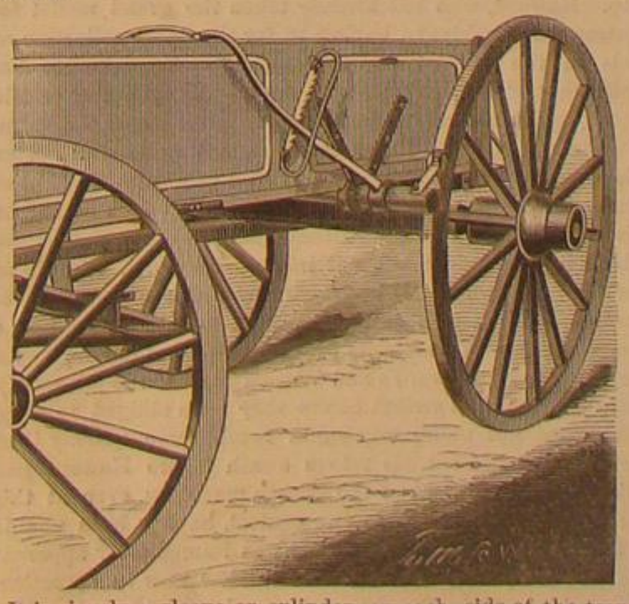
HOUSTON'S PORTABLE PHOTOGRAPHIC CAMERA.

THE CENTRIFUGAL GUN.

This gun was tried in our late war, failed as a moment's thought would have shown that it must, and is now having its day over again in Europe, and attracting considerable notice. It proposes by the turning of a crank, to hurl sixty to one hundred death-dealing bullets a minute. The question is, where is the power to come from? It seems to be supposed to reside somewhere in the crank, the gearing, or the balance wheel. It is the old inexpugnable dream of creating power out of leverage. If the machinery concentrates muscular power so as to enable a man to throw bullets with deadly force, it must more than proportionally diminish the number thrown. If he can throw twenty bullets a minute by hand, with one tenth the velocity necessary for fighting, a machine, wasting not over half the power, might enable him to throw one bullet a minute with the full force required, but without aim. A powerful steam engine, though not half as economical a motor for the purpose as gunpowder, might hurl from a fortification, quite a shower of balls at random: but if directed through gun barrels with accurate aim, it would be almost impossible to bring sufficient steam power to bear for any marked effect. What sort of a cylinder and piston would it take to project a 1000-lb. ball to a distance of two miles?

SCOFIELD'S WAGON BRAKE.

The operation of "backing," even on a level, is annoying to the driver and laborious to the horses of a team. Not less discouraging, and perhaps more dangerous, is the holding back of a wagon, coach, or any other vehicle—especially if heavily loaded—in descending an incline, as a steep hill. Certainly an efficient and easily operated brake, not unsightly, and never in the way when not wanted, would seem to be desirable. Such appears to be the contrivance shown in the engraving.



It is simply a sleeve or cylinder on each side of the team, near either the front or hind wheels, and turning on a shaft fixed to the body. To this cylinder is attached a properly shaped shoe formed so as to engage with the wheel, either on a curve corresponding with the circumference of the wheel, or on a curve which gives it a cam shape, so that when the pressure is upon the wheel the resistance of the brake or shoe shall correspond.

It may be held in position when placed, as well as operated, by the lever. It appears to be a simple device, cheap, effective, and substantial. The lever can be held by ratchet teeth, as shown, fixed on the side of the wagon. This device was patented through the Scientific American Patent Agency, March 26, 1867, by B. B. Scofield of Woodhull, Ill., who may be addressed for further particulars.

TRADE MARKS—THE LETTER "G."

The law of trade marks becomes a subject of increasing importance, corresponding with the progress of invention and manufactures in the country, and is rapidly assuming the fixed status which it long since attained under older governments. For, although an invention may be secured by patents against imitation in its substantial features, deceptive imitations of its form, appearance, and title or trade mark, are still possible and doubly injurious, unless prevented by law. To render this protection more direct and certain, the growing custom of patenting designs and marks is very useful and will often save heavy costs in litigation. A fresh illustration of this subject appears in the injunction recently granted by Judge Daly against a party who had been selling sewing machines in the form of the letter G, which form is claimed by the Wilcox & Gibbs Sewing Machine Company as a trade mark. The inventor of the first in the series of improvements constituting the Wilcox & Gibbs machine (Mr. James E. A. Gibbs) gave to the machine by accident or design, the form of his family initial "G," under which it has since become famous. As there was no mechanical utility in the mere form, it was held that there could be no motive for imitating it but to profit by the reputation of the Wilcox & Gibbs machine, to the injury of the company's trade and reputation, and the deception and detriment of purchasers. The defendant was perpetually enjoined against making or vending any machine in this form, or in connection with this letter as a symbol or trade mark.

EDITORIAL CORRESPONDENCE.

The Trip to Paris—Something That Travellers Should Know—Novel Railway Signal—Cost of Living, etc.

PARIS June 1, 1867.

It was most exhilarating for us to catch the first glimpse of France after having experienced so much of the discomforts of the sea. Purgatory is defined by some religionists as a place where souls are refined after death. I think it possible that some people might derive this advantage from a voyage at sea: for my part I can think of no other. I desire to say a good word of the steamer *Pereire* of the French line, and also of Capt. Duchesne, her very skillful commander. This new line of transportation is rapidly gaining favor and, unless there are special reasons for visiting England, I should say that a voyage to Europe, making the first landing at Brest, would be generally the most comfortable; but I have such vivid recollections of the horrors of the sea that just now I feel inclined to advise Americans to stay at their comfortable homes. We made the passage in about nine and a half days, and on the morning of the 14th of May we entered the harbor of Brest, and were speedily transferred by a little steam tender, to the custom house, there to undergo the inquisitorial rummaging of trunks, satchels, etc. The distance from Brest to Paris is I think about 450 miles, and the run is made in 16 hours, in very comfortable cars, over an excellent railway, and through a country of much rural beauty—old Brittany, full of legends, and superstitions, and rude remains.

It was a charming sight to look upon the flowers in full bloom, and the crops of grain and grass which seemed to be

rapidly preparing for the harvest; but the old rusty, thatched cottages of the peasantry, indicate anything but those comforts such as cluster in and about the homes of our American farmers. The presence of the French Government is immediately felt, the moment the foot touches the soil. At every station, even at the most insignificant ones, stands the policeman with cocked hat, epaulettes, and sword, a lazy lout, whose services seem as unnecessary as such a character would be at one of our country churches on Sunday.

Be it said to the credit of French railway management, that we made the whole distance without losing a minute at any of the stations, and reached Paris exactly on time. I suppose that no railways in the world are better built or generally better managed. Some of the French railways have recently introduced a very novel system of signalling to the conductor of the train when his services are especially needed. At first sight the contrivance resembles a small triangular looking glass, but upon closer examination a small ring is visible behind the plain glass. I give the translation of the instructions which passengers are expected to observe, as follows:—"Should any extraordinary occasion require the presence of the guard, passengers are requested to break the glass with the elbow, draw down the ring, agitate the arm through the right hand window, according to the direction of the train. Any passenger having called without reasonable cause will be liable to prosecution." Anything less than a murderous assault, I suppose would be visited by legal penalties. The idea of stopping a train of cars in this way strikes an American as very ridiculous. It will not do here to expose the bell cord where any one can pull it at pleasure; a Frenchman can't be trusted in that way. The absence of fuel and timber in the country distressed me. It is really a source of great weakness to the nation, the coal coming chiefly from Belgium.

I suppose that few of the readers of the SCIENTIFIC AMERICAN care for details of European travel. This whole business of telling what one sees abroad has been so thoroughly overdone in books, pamphlets, and newspapers, that I shall forbear many such details; but inasmuch as this is an exceptional year, when so many of our countrymen are coming here for the first time, I propose to jot down a few items of information which may be useful to a few inexperienced travelers. It is not now necessary to have a passport to land in France, but if a visit is contemplated to Austria and the Papal States a passport should be procured from the Department of State. A passport is handy in foreign countries, as with it and in case of trouble a call for assistance can be made upon the consular agents of the Government. On the voyage it is always well to be provided with good fruit, and poor clothes. The French government exercises no unpleasant surveillance over persons who land upon its shores, but the government is sensitive about the introduction of tobacco. It holds this trade as a monopoly, which now yields annually over $30,000,000 to the treasury. Americans cannot be blamed, if they love the noxious weed, for bringing their cigars with them, but they will save themselves a good deal of trouble by at once declaring what they have. Such a course will probably save all further examination of baggage. Another thing: travelers should be very cautious not to offer money to the Custom House officer. The French people are always eager to get money, yet in this particular service the officer well knows that it would be extremely hazardous for him to accept a gratuity. If a duty is paid on tobacco, a receipt should be taken, as upon reaching the barriers of the city of Paris, the presentation of this receipt will usually prevent another examination. The city of Paris collects an *octroi* or entrance duty upon wine, wood, fruit, beer, verjuice, oil, cider, sausages, and all other articles consumed by the people. These sources of municipal revenue yield nearly $20,000,000 annually. Americans will feel extremely awkward in France without a tolerable knowledge of the spoken language. One may soon pick up enough French to order a cup of coffee or a beefsteak, but this does not serve the sight seeker, who will be naturally curious to know something more of the numerous objects of interest than can be gained from guide books. These guide books necessarily glide flippantly over many objects that possess a deep historic interest, and which cannot be discovered by the optical sense.

Unlike New York and other American cities, the visitor depends mainly upon the public carriages to be transported from place to place. The city rail car has not yet been licensed to monopolize and destroy the beauty and comfort of the streets of Paris. There are now over 10,000 of these public carriages in constant use, and 10,000 more would now find employment. A French cabman knows nothing at all of our language and does not care to know. It is for his interest usually to pick up strangers who are mainly ignorant of what they really want, and therefore most easily gulled. To take a cab by the course is an easy thing, but one must learn by experience that every stop, if ordered but for a moment, doubles the fare—makes another course. If by the hour, the traveller is at once overcome by the melancholy sensation that he is journeying toward a burial ground. A tolerable knowledge of the language and a few *sous* usually operate to hurry up the driver, but if one must needs sit dumb like a piece of statuary, the whole thing becomes extremely oppressive. An American may swear and scold as much as he please, it will fall upon the cabman's ear like music.

American ladies should not leave home without providing themselves with a good outfit. The stories about cheap clothing and ready-made trappings for ladies are dreams of the fancy, at this time especially, and are kept in circulation for the purpose of filching the pocket. Whenever it is known—and the fact gets current in some way very quickly—that an American lady lands in Paris not clothed, an army of milliners, dressmakers, chemisiers, shoemakers, dealers in laces, shawls, night caps, shoes, shoe blacking, etc., beseige her lodgings and bring to bear all the refined arts of prevarication and polite swindling. The trial is excessively annoying and my experience is that it does not pay.

The prices of every necessary article are very high in Paris, the city is thronged with strangers, and Americans who come here expecting in some way to live cheaper than at home will be disappointed. For instance, the price of the rooms at the *Hotel du Louvre*, where I am now staying, were to day advanced twenty-five per cent. I understand that it is very general throughout the city. I have now one room that accommodates me very well, for which I pay $7.50 per day, all meals extra. A good beefsteak 50 cents, cup of chocolate 45 cents, coffee the same, which includes bread, a sperm candle 20 cents, a plate of asparagus 80 cents, and besides, almost every man and woman you meet expects you to give them something extra; for genteel begging is done here to perfection.

The above are first class prices, but will generally serve as a guide to those who expect to eat something besides horse-meat, thin vegetable soup, boiled sorrel, or bread and coffee. A common one-horse carriage, drawn by an uncommon horse, can now be obtained for $8 per day, besides an extra dollar to pay coachman's "drink money;" total abstinence people take notice. I will however drop this subject, as I remember the old saying that "no one ever learns anything from the experience of other people."

There is a wonderful stir in the streets to day and all Paris is alive with interest. Squads of policemen are moving about the streets, mounted guards are hurrying to their posts, along the line of the principal streets the flags of various nationalities are floating from the windows. It is quite noticeable that the flag of the United States is very prominent. As I now write the Emperor of Russia is landing in Paris and the Emperor Napoleon with his retinue has gone to the station to meet his illustrious visitor. I must drop my pen, as in a few minutes the cortege will pass, and I wish to get a look at the Czar who has been so good a friend to our country.

S. H. W.

Special correspondence of the Scientific American.

TRIAL OF AGRICULTURAL MACHINERY---SUCCESS OF AMERICAN INVENTIONS.

PARIS, May 24, 1867.

The jury on agricultural machinery, seem determined to to award their prizes on some more definite information as to the merits of the various implements exhibited, than is to be obtained by a merely superficial examination of them as they lie in the annexes. For this purpose they have arranged to have a series of competitive trials on the Emperor's farm at St. Cloud, and the results of these will be the basis of their awards. The first of these trials, which took place yesterday, was between the horse mowing machines. Quite a large number of gentlemen and some ladies were on the ground, and had the day been more agreeable, it would have been a very enjoyable excursion. The ground chosen for the operations of the machines, was a large, tolerably level field, grown over with a much larger proportion of weeds than grass; in addition to which, the recent heavy rains had made the soil into a paste of about the proper consistency for brick making, and as the grass was full of high, clayey ant hills, it was quite apparent that it was the intention of those who selected the field, that the capabilities of the machines for rough work should be fully put to the test. About fifteen or sixteen machines of different manufacturers, French, English, and American, were on the ground. The field had been divided by previously mowing straight and parallel swarths into the same number of exactly equal patches, containing about two acres each. No difference in the character of the ground could be distinguished, and I heard no complaints of unfairness in the trial. At a given signal, the first half of the machines began their work. Among these were W. A. Wood's, Hoosic Falls, N. Y., Howard's, (English), and some French and other machines. The unfavorable nature of the ground was soon apparent, as some of the machines were obliged to stop to clear their gearing before they had gone fifty yards, while none completed the first swarth without having to stop. Howard, who has already taken the grand medal for agricultural machinery, having by far the finest collection of tools in the Exhibition, although an Englishman, has made himself very popular with Americans by a very candid report, which he had the manliness to make before the Farmer's Club on his return last fall from a tour in the States, where, unlike many, he was able to see evidences of peculiar genius among our people. The machinery which he had on trial was of an American pattern, (Marsh's), the patent for which he had purchased, but improved by him, and called the Howard mower. It was drawn by a magnificent team of horses—a pair always seen at trials where Mr. Howard is a competitor, and the majority probably expected that he would carry the day. Howard's and Wood's machines, both nearly completed the first swarth before they were obliged to stop, but Wood got under way again much more quickly than Howard, and had cut his return swath before Howard had finished his first. One of the French machines, even at this early stage, withdrew from the contest, having been unable to cut half of its first swarth. It was immediately apparent that the competition among the number now in operation, would be between Wood and Howard, and the odds were already much in favor of Wood. As the mowing progressed, these indications were confirmed, and before any other machine was half through, Wood had cut down all his patch—the time occupied having been ninety-four minutes. Like all the other machines, this one was obliged to make numerous stops to free itself from dirt and clogging; but these were not so frequent nor as long as those of its neighbors.

After the jury had had time to examine the working of the first set of machines, but before these had completed their work, the second set were put in motion. Among these were a one horse American machine, called the Clipper Mower, which, before the start, elicited a good deal of praise from the spectators. The Perry Mower, also a favorite, on account of its simple construction; a Seymour & Morgan machine of French construction, and a McCormick mower, besides other English and French machines. The difficulties experienced by these were quite as great as those of the first set. The Clipper Mower disappointed its admirers by the bad work which it did, cutting too high and imperfectly. The Perry Mower got on pretty well, though it broke off its track clearer in turning around at one end of the field. The Seymour & Morgan machine was a combined reaper and mower, and was the only machine having a reel in front of the cutter. At first sight, owing to its combining so much in one machine, it appeared rather complicated in comparison with its competitors, but until near the end of the trial it appeared to be doing quite as well as any of the others. When it came to its last swarth, however, it had great difficulty in making any progress, and was obliged to stop at every step, and at last had to relinquish the attempt to finish. The McCormick machine was the only one of the second set that was able to complete its patch, and occupied in so doing, 2 hours and 13 minutes: or 39 minutes longer than Wood's machine had taken.

It is stated that a second trial will be given to Howard's, Wood's, Perry's and McCormick's machines, as the former was finally diabled by breaking off three guards in a clay-hill, and the Perry was also partially injured by losing its track clearer. The grass for this next trial will, perhaps, be of a closer and better quality also.

It will thus be seen that as a whole, the trial was exceedingly severe, and the Americans may take the credit to themselves that the only two machines that were able to get through with their work, were Yankee machines, and the four which are to have a new trial are also American in design.

Another trial will also be had subsequently, in which the dynamometer will be applied to ascertain the amount of tractive force required.

Similar trials, it is understood, are also to be made with plows and other agricultural implements. If, however, the competition is extended to steam plows, &c., we shall have to fall out of the ranks, as we have none on exhibiton, and the French and English will alone compete.

SLADE.

Repairs of Rails.

By the kindness of Mr. W. A. Herring, C. E., of the Mississippi Central Railroad we are furnished with a letter from the General Superintendent of the Wilmington and Weldon (N. C.) Railroad detailing his plan for repairing worn-out rails. It contains information which may be of use in many parts of the country.

W. A. HERRING, ESQ.—*Dear Sir:* Your letter of the 3d of March, came to hand a few days since. You desire to know what has been my experience in railroad mending, the process, etc. I take pleasure in replying. I consider the rail mending operations on this road second only to that of repairing engines and cars. It is certainly of the greatest importance to all railways located as this is, far from rolling mills and iron markets. The saving in repairs of track are very considerable.

The cost of mending or repairing rails we had reduced before the war to about seven dollars per tun, and by the process we reclaim rails that will wear half as long a time, and sometimes two thirds as long as new ones. I speak of the average durability of new and repaired rails. Some of the repaired rails may not wear more than one or two years because there are other defective places along the rails that afterward show themselves; but the average service they will perform is not less than five years with us and new ones will not average more than ten years.

I may therefore say that the average durability of mended, welded, or otherwise repaired rails will last about half as long as new ones. The process is simple and will suggest itself to almost any blacksmith. We have an anvil or swage block, sometimes called a vise block, by means of which the rail is formed after the welding process is completed. The mending consists in trimming off all the bruised and laminated parts of the rail ends, or in the middle when the rail has been crushed, and then, after fitting a flat piece of iron to the place that is to be mended, we take a welding heat on both parts—rail and flat bar—and as they come on to the anvil lay on the patch and weld it up, all at one heat, and shape and trim the rail. If the work is properly done, the repaired end outlasts any part of the rails. We also cut rails and take two pieces, say ten to twelve feet long, cutting out the defective parts, and weld them together, thus making a complete and frequently a long rail. Cut the ends to be welded in the shape of a fish's mouth open, and place them together in the furnace, and as the iron reaches a welding heat the ends of the rails are struck and thus driven together and welded in the center; when this is sufficiently firm, the rail being connected, it is drawn on to the anvil, and the lips hammered together strong and secure, and formed in the swage block. I have tried the strength of rails thus mended, and have very seldom found them defective; never unless the iron is burned in the process of welding or the welding is imperfectly done.

I believe I am the originator of this operation (welding two rails together) as I had never seen it done before. We have found very great economy in the operation. This road could not have been kept in running order during the late civil war but for this mending operation; and we then carried the mending to a much greater number of rails than we would have done could new rails have been obtained at any reason-

able price. The cost of furnace and anvil complete is from $100 to $150. You need a good blower for your furnaces. We use a large sized fan blower to drive our foundery—seven smith fires and four rail furnaces—and have plenty of blast.

You can easily calculate the saving to your company by mending rails; the cost is not more than ten or fifteen dollars per tun, say not more than sixty cents for each end welded up for the labor, with fifteen cents for the iron and coal consumed in the operation. We use either bituminous, or anthracite coal, but prefer anthracite; the old scrap about your shops will do for patches. Therefore if you mend both ends, and it takes seven rails for a tun, you have but $10.50 for fourteen ends, or one tun of rails. But frequently only one end wants mending, and then again I charge in my estimate the cost of hauling the rails to and from the shop.

I will give you any further information in my power on this subject at any time. I am, very respectfully, yours,

S. L. FREMONT, Chief Eng. and Gen. Supt.

Type Writing Machine.

A machine by which it is assumed that a man may print his thoughts twice as fast as he can write them, and with the advantage of the legibility, compactness and neatness of print, has lately been exhibited before the London Society of Arts by the inventor, Mr. Pratt, of Alabama. He draws up his alphabet in a solid square battallion, say seventy characters in seven rows, the whole in a solid electrotype plate about five-eighths-inch square or more according to the size of type desired. He prints a letter by the blow of a minute hammer of uniform size with all the type bodies, striking the face of the letter, with the paper interposed, and a carbonized sheet also between that and the type. Each letter, as wanted, is moved into position before the hammer by compound levers actuated by keys like those of a piano. The same touch of the key readjusts the paper to the new impression (with or without a space before it, according to the force used), re-adjusts the type plate so as to present the desired type to the hammer, and gives the printing blow. Simple arrangements also retract the page at once laterally and vertically to begin a new line. The type plate and paper are placed vertically, the latter with its face to the operator, so that the work done is before his eyes as in writing. The keys actuate two double-acting levers, one of which raises or lowers the type plate, while the other moves it laterally. Each key is so applied to the levers as to adjust the plate at once sideways and vertically to the position for bringing a particular character into play. Or, a better way, one key will do duty for the vertical movement of each entire horizontal row, another key for the lateral movement of each vertical column; and thus by pressing two keys for each character, seventeen keys will be sufficient to operate the whole font of seventy characters above supposed. The case of the instrument is small and compact, the parts are mostly of wood, and it could be manufactured and sold on a large scale for about $15 with a handsome profit.

The subject of type writing is one of the interesting aspects of the near future. Its manifest feasibility and advantage indicate that the laborious and unsatisfactory performance of the pen must sooner or later become obsolete for general purposes. "Printed copy" will become the rule, not the exception, for compositors, even on original papers like the SCIENTIFIC AMERICAN. Legal copying and the writing and delivery of sermons and lectures, not to speak of letters and editorials, will undergo a revolution as remarkable as that effected in books by the invention of printing, and the weary process of learning penmanship in schools will be reduced to the acquirement of the art of writing one's own signature and playing on the literary piano above described, or rather on its improved successors.

A Great Iron Floating Dock.

An immense iron floating dock for ships of the largest class is now building in England on a novel plan (patented), for the service of the Government at the naval station of Bermuda. It is proposed to tow the enormous mass (380x 123x72 feet) across the Atlantic. It is constructed of a semi-cylindrical form, like a ship, in six series of longitudinal compartments, viz: two series in the bottom, to be kept empty, one series on each side, at midhight, as balance water chambers; and one series on each side, at top, as load water chambers. The water chambers are kept full, and the dock thereby sunk, when not in use, and all is thus ready for the immediate raising of any vessel at a moment's notice, without the use of pumps or machinery. The vessel having been towed into the dock, without closing the ends, the gates are opened in the upper load chambers projecting above water (by the weight of which the dock is sunk) and they are emptied into the sea. The dock and vessel are thus raised sufficiently to permit (the ends being then closed) the remaining water in the dock to be drawn off into the air compartments in the bottom, leaving the dock clear for the workmen. Afterwards, at leisure, the water is pumped out of the bottom compartments into the load chambers at the top of the sides, for the next occasion. For docking small vessels, hollow floats or pontoons, fitting the bottom interior of the dock, are proposed, which will be emptied as above into the bottom air chambers, and will then be floated out with their load, making room for other vessels. By emptying the water chambers on one side only, the dock can be easily careened for repairs.

The Petroleum Trial.

The first experimental trip of the *Palos*, June 14th, with petroleum as fuel, resulted in a total run of 25 nautical miles in 1 hour and 55 minutes, or a little over 13 knots an hour. The reported result is almost incredible, as the *Palos* is only an 8-knot steamer, with coal. Four barrels of oil were consumed on the trip, doing the work of eight tuns of coal. The oil drips into a hot iron retort, where it is converted into gas and mingled with steam and air in exact proportions to produce entire combustion and the most intense heat, which is distributed to the heating surface of the boilers with such effect as to raise steam in 25 minutes, where three hours were required with coal. Such is the case thus far, as made out by the friends of the improvement.

We add the following letter from Engineer Alban C. Stimers relative to this interesting trial and the subject of petroleum for fuel. It was addressed to the New York *Times*:

NEW YORK, Monday, June 17, 1867.

I observe in your editorial remarks in Minor Topics, in adverting to the Boston petroleum fuel experiments, in this morning's paper, an inquiry regarding the "original source of the steam that is taken from the boiler and passed into the retort that generates the vapors that make the heat that raises the steam in the boiler."

Having closely observed the various efforts made during the past five years to employ petroleum in lieu of coal for a steam fuel, I take the liberty to offer the following explanation in reply to your inquiry.

The introduction of superheated steam into the retort where the oil is vaporized is not essential to the making a fire and getting up steam, but it is to burning said vapor with the completeness of combustion necessary for it to compete with coal as a steam fuel. In burning the vapors of petroleum it is necessary that every particle of the vapors shall come into close contact with a corresponding particle of atmospheric air; but air and the vapors of the oils appear to have the same repellant qualities as oil and water, and do not mix enough to prevent the formation of a thick black smoke, and the heat developed is comparatively very small.

All who have attempted the use of petroleum for a steam fuel, appear to have early learned the great advantage of introducing superheated steam to the vapors. When this is done, the air mixes readily with the compound, and a more complete combustion is effected.

Although, as I have already stated, steam could be raised in a boiler from burning the oil vapor only, yet it is done much more quickly and pleasantly if a supply of steam can be had, and I observed that on Friday last the fires of the *Palos* were assisted with steam from a sister vessel, the *Leyden*, which lay alongside.

The first experiments tried to test the practicability of employing petroleum for generating steam were by Shaw and Linton, in Philadelphia. I was member of a Board of Naval Engineers, ordered by the Department to conduct and report upon the experiments. They continued during five months, and our report is dated May 5, 1863.

In that arrangement, "the apparatus used was an ordinary tubular locomotive form of boiler containing fifteen tubes, two inches in diameter and fifty-six inches in length; a small steam engine, in connection with it, operating a pump supplying water to the boiler; with an additional boiler of very small dimensions, placed in a heating apparatus, to provide a steam jet, previous to firing up with the oil, in the absence of other means for procuring the necessary artificial draft until steam was raised in the larger boiler."

This would be a good arrangement for Colonel Foote to employ with his process. The great merit of Colonel Foote's process over all those which have been tried in this country and in England, consists in his forcing the air, necessary for the combustion of the oil, directly into the retort where the latter is vaporized, and as super-heated steam is introduced simultaneously, *the air becomes thoroughly mixed with the vapors before they issue from the burners* and the combustion is consequently perfect when the proper proportions of air and oil are maintained. This desideratum is never attained in any other process yet brought to my attention.

When an inventor comes to me and describes the brilliant white flame which he produces with his greatly improved petroleum burner, I know that he cannot compete with anthracite coal in economically generating steam. And Colonel Foote is the only one who has shown me a fire where all that was visible was the blue hydrogen flame, which every chemist will understand is—with such a combustible—the hottest attainable fire.

Editorial Summary.

IMPROMPTU HAT.—A French machine in the Exposition exhibits the manufacture of a finished felt hat, ready for use, in fifty minutes. The first operation consists in blowing out, by means of a fan, about four ounces of rabbit's fur upon a revolving cone or mold of copper, pierced with holes, from which the air is exhausted, causing the fur to adhere to the cone. It is then covered with a wet cloth and steeped in a tub of hot water for a few minutes, after which it undergoes the processes of drying, heating, rolling, binding, and lining with silk, and comes out a perfect hat.

INTERESTING ARCHÆOLOGICAL DISCOVERY.—Sir Henry Rawlinson has recently succeeded in uniting and thus completing two separate portions of an Assyrian record covering 243 years of the empire, one of which is the year of the computed eclipse of the sun, 763 B. C. This event is distinctly noted in in the record at a date varying not over 40 years from Archbishop Usher's chronology. The genuineness and authenticity of the record, the accuracy of the reading and translation, and the correctness of the chronology computed from the Hebrew Scriptures, are all established at once, by their coincidence with a fact, demonstrated by modern astronomy. The record was upon two separate blocks in the British Museum, the one containing the names and the other the dates, and not hitherto supposed to have any connection with each other. We have now but few chapters in the history of ancient nations written out so authentically and accurately as that of Assyria at this period, from the time of Benhadad and Ahab nearly to Josiah.

MISCELLANEOUS.—The report of one of the British Railway Commissioners, Sir Rowland Hill, states that the personal injuries on all the railways in the United Kingdom are fewer than those by ordinary vehicles in London alone. ——De Suca, having examined the water of the vase at Pompeii, shows that it had not remained there, as supposed, for eighteen centuries, but was a deposit of filtration from heavy rains.

BALMORAL skirts are now manufactured of felt.

CINCINNATI has several furniture factories on the co-operative principle. The Cabinetmakers' Union, established in 1857, paid in 1866 $13,000 of profits and $13,000 in interest. The Queen City Company was established in 1864 with a capital of $10,000; the Cincinnati Association started in 1863, has a capital of $10,000; the Central Association, incorporated in 1866, has $20,000 capital.

LIEBIG'S ARTIFICIAL MILK is an imitation, as close as chemistry can make, of the natural food of the human infant. It is prepared as follows: Half an ounce of wheat flour is boiled to a paste in five ounces of skimmed milk. To this is added immediately a mixture of one-half ounce of bruised malt, one ounce of water, and three grammes of a solution of two parts of bicarbonate of potassa in eleven parts of water. The whole is then kept warm by standing within an envelope of tepid water until it is no longer pastry, but of a creamy consistence. After fifteen or twenty minutes it is put on the fire for a few seconds only, and then strained through a fine hair sieve. It should be allowed to stand long enough to deposite some fibrous matter before it is given to the child or invalid.

A CURIOUS CHEMICAL OBSERVATION.—Becquerel, senior, has found that chemical decomposition and combination take place actively and with peculiar results, between two solutions connected by an inappreciable fissure, or water-tight joint. A tube with such a fissure in its bottom, being filled with a solution of nitrate of copper, none of the liquid pours mechanically; but on immersing the bottom of the tube in liquid proto-sulphuret of sodium, an electrical action takes place, and a double decomposition and recomposition ensues, indicated by the appearance of crystals on both sides of the fissure, which are not always of the nature required by theory, but are modified by the capillary action of the surfaces.

TIN FOIL is generally manufactured with an analogy to the new lead-cased tin pipe, by enclosing an ingot of lead between two ingots of tin, and thus rolling them. The "pure" article, according to a writer in the *Pharmaceutical Journal*, has been found to contain 34.62 per cent of lead, and the common, 86.93 per cent.

FILES.—M. Taborin, one of the oldest French manufacturers of files, has contributed two sums of 3,000 francs each, toward prizes to be offered by the Academy of Sciences for a file-cutting or file-forging machine.

ANOTHER OXYGEN PROCESS is reported in the *Chemical News*. On heating a concentrated solution of chloride of lime, with only a trace of freshly prepared moist peroxide of cobalt, the hypochlorite of lime was completely decomposed into chloride of calcium and oxygen and no chloric acid was formed. The evolution of oxygen commences about 70° or 80° and continues in a regular stream, with a slight frothing of the liquid. The peroxide made use of in one experiment may be employed again to decompose a fresh quantity of hypochlorite of lime.

A STEAM HORSE, OR A HORSE LOCOMOTIVE?—Mr. Stamm, of Milan, has made a vehicle in which the strength of a horse is re-inforced by that of steam, while the steam power gains in application the advantage of the horse's intelligence, so that both work together and are managed as one by the reins. When the horse moves forward, his traction applies the steam; when he is pulled up, his backward action shuts it off, and if rigorously applied, reverses the engine, which backs as he backs, stops backing as he stops, and again starts forward as he starts.

HANGING GATES.—An engineer in India, where gate-posts find proverbially insecure bearings in the deep black soil, suggests a mode of hanging by which the strain of the gate's weight would be transferred from the top to the bottom of the post. The shank of the top hinge passes loosely through the gate post and fastens in an upright lever behind it, which hinges to the bottom of the post beneath the ground, and has its fulcrum against the post near the ground. The weight of the gate thus pulls on the upper end of the lever and pushes against its fulcrum near the ground, shortening the leverage of the strain by the whole distance between the two hinges of the gate The whole pressure against the post is exerted close to the ground.

HYDROGEN has been collected from meteoric iron by Mr. Graham, to the amount of nearly two and a half times the volume of the metal. The iron of our planet is characterized by a predominance of carbonic oxide in its contained gases. Hydrogen having been recognized by means of the spectrum as the principal element of a numerous class of stars, the two evidences point to the origin of the meteorite in a dense atmosphere of hydrogen. Under the pressure of our atmosphere, it has been found difficult to impregnate iron with more than an equal volume of hydrogen.

CHESTNUT OIL, prepared on a large scale, in France, from horse chestnuts by chemical treatment, is very fluid, absorbable by the skin, and has met with great success as an application for gout and rheumatism. Stearin, syrup of glucose, alcohol, and starch are also among the incidental products.

MARINE SILK.—A Frenchman has found in the eggs of fishes of the family of sebacians (the ray), the exterior envelope is a tissue of filaments which are easily separated and manufactured into silk. The exterior also contains a white albuminous substance which answers the purpose of whites of eggs for printing on tissues.

ARTIFICIAL STONE is in greater favor with the French than with any other people. They are even using it in enormous blocks of over 120 tons weight, in building the new works in the harbor of Brest, called the "Port Napoleon." The material consists of rubble-stone, Portland cement, and sand. The blocks are lowered into position as foundations in the water, being constructed with wooden blocks in the interior, near the four corners of the upper face, into which iron suspension pivots are inserted. Artificial lithographic stones are also made for presses which require cylindrical stones of larger size than are easily obtained from nature.

DENSITY OF OZONE.—M. Soret has proved the density of ozone to be one and a half times that of oxygen, by the test of diffusion, the relative velocities of which correspond to the theoretical calculation on the assumption of the above proportion; as well as by comparisons of volume, in which it is found that by converting ozone into oxygen, its volume is increased one half.

NEW ANILINE DYES.—Three new and distinct coloring matters have been reduced from the residue of the manufacture of rosaniline, to which have been given the names of mauvaniline, violaniline, and chrysotolindine.

THE STEEL-FACED COMPOUND ARMOR PLATES, made by Charles Cammell and Co., of Sheffield, bore a notable test at Shoeburyness on the 14th ult. The plate was of two and a half inches thickness of a special hard steel, welded with four and a half inches thickness of iron without backing. The 7-inch Palliser rifled shot, weighing 117 pounds, entered the plate at right angles and stuck, with its point just through at the back. Fired obliquely, the shot broke up. John Brown & Co.'s plates of the same construction let the shot clean through.

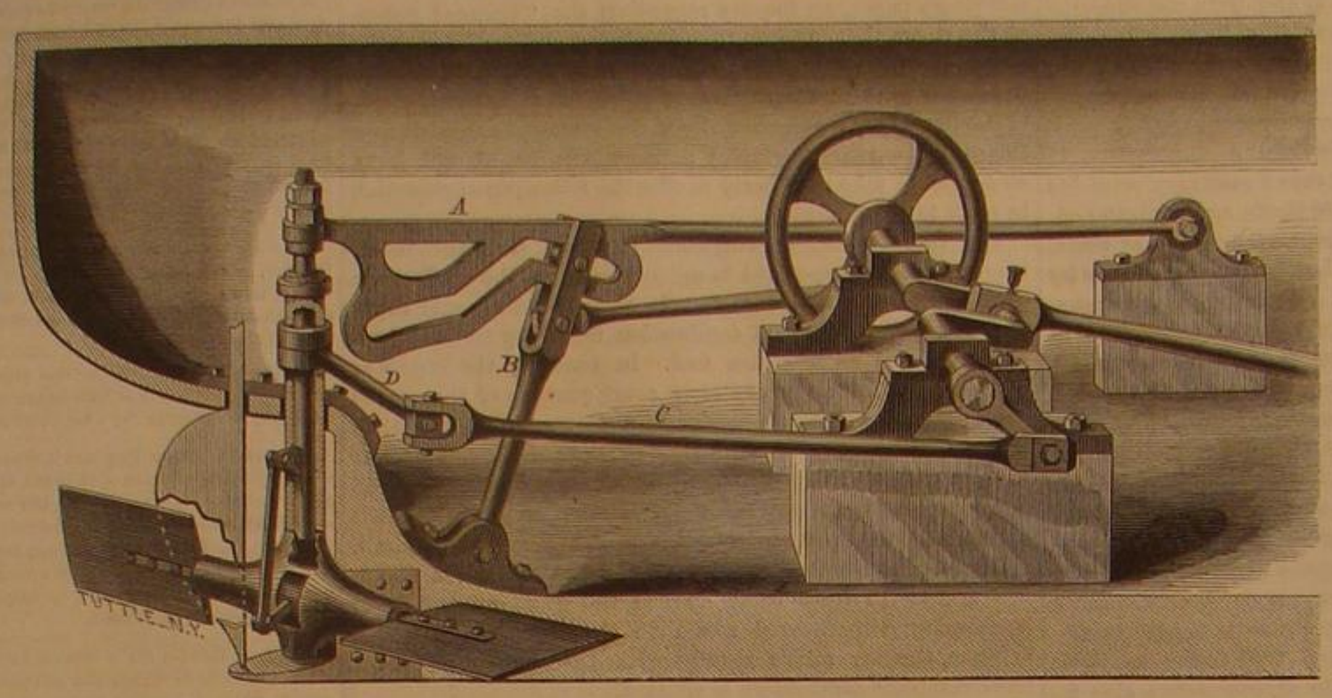
SILVER INLAYING.—A cheap and simple process recently published consists in first engraving with nitric acid or otherwise the metallic surface to be inlaid, with the desired pattern, and then rubbing into the depressions a little moistened nitrite of silver. When perfectly dry, the metal is heated until the nitrous acid is driven off, and the metallic silver fills the hollows in a spongy mass. This must be rubbed down and compressed well into the engraving with a burnisher. The silver thus inlaid adheres inseparably, and is of the utmost purity.

WHITE AND COLORED INLAYS AND ENAMELS of almost indestructible hardness and beautiful polish may be made on wood or metals with oxychlorides of zinc. The oxide of zinc, very pure and dense, is made into a stiff paste with water (if pigments are used, they are introduced into the dry oxide in powder), and introduced into the hollows to be inlaid, where it is allowed to dry. It is then carefully painted over with a strong solution of chloride of zinc, and the two compounds unite chemically, forming a very hard and dense substance. Before it sets, it may be polished with a piece of smooth, hard wood. If the object is such that the application can be performed very quickly, the oxide and chloride may be first mixed and introduced at once. It is an advantage to have all the materials warm.

THE new pulley belt for the Roger Williams Flour Mills is 134 feet long and 4 wide, and is made of whole hides cemented together, without lacing, pegs or rivets.

New Method of Propelling Vessels.

The ordinary propeller and the paddle wheel have had many rivals to their work as a means of propelling ships. The turbine wheel and other methods of propulsion by jets of water have been tried with a greater or less degree of success. This plan herewith presented, differs materially from most, although a somewhat similar but crude attempt was made in the early days of steam navigation. Instead of a revolving propeller there are two blades working by a reciprocating motion at the stern of the ship. In the engraving the proportions of the machinery as intended to be employed are not entirely correct, as the design was made from an imperfect model. The principle and its application are however sufficiently explained. An upright shaft at the vessel's stern has two horizontal bearings under water in which turns a shaft having at each end a wide propelling blade. The upright is hollow and inside is a shaft which can slide up or down, by which the horizontal paddle shaft can be turned one fourth of a revolution. This is effected by a connection between the upright sliding shaft and an arm on the horizontal paddle shaft, and the motion is given by means of the cam frame, A, and rocking bar, B, which is driven by a crank or eccentric on the main shaft of the engine. Each end of this cam frame has a slot struck on a radius, of which the pivot of the rocking bar is the center, so that on those portions of the cam-slot the motion of the bar does not raise nor lower the upright sliding shaft which turns the propeller blades. During this period of rest a motion is given the blades in a horizontal plane describing a segment of a circle. This motion is received from the crank on the main shaft through the medium of the bar, C, and arm, D. Back of the step on which the upright shaft turns is seated the lower end of the rudder, which thus works between the propeller blades.



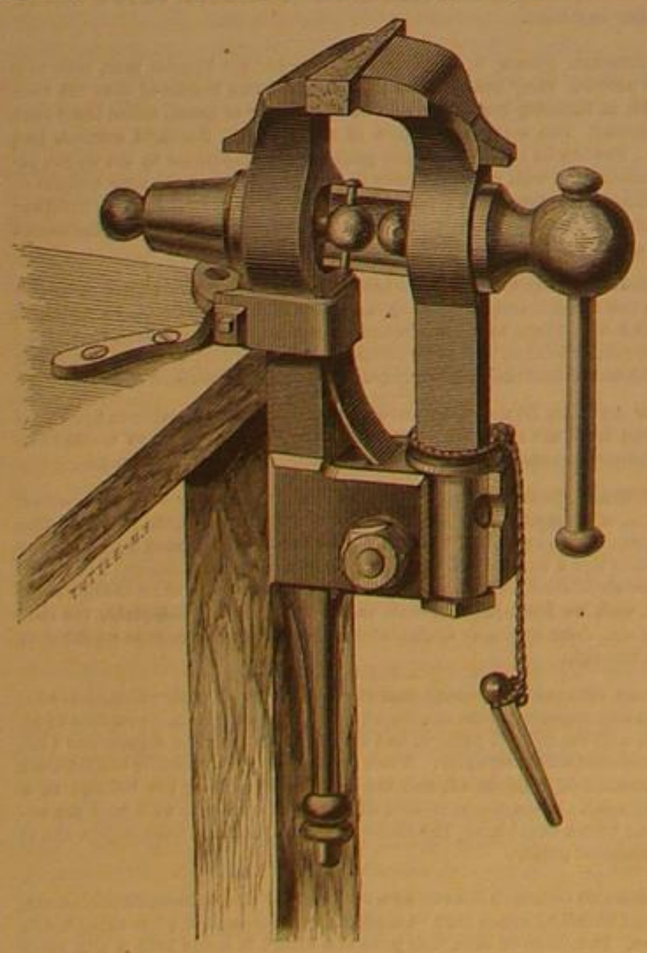
WAIT'S RECIPROCATING PROPELLER

The operation of the device is as follows: The blades are thrown alternately against the water by the crank of the engine, only one blade acting at a time, the other being "feathered." The two motions of the blades, both a portion of a revolution, one in a vertical and the other in a horizontal plane, are produced by very simple mechanism, and the result as tested by working models is very satisfactory.

It was patented through the Scientific American Patent Agency, Feb. 19, 1867, by Samuel B. Wait of Mariner's Harbor, Staten Island, N. Y. who will answer all inquiries relative to the invention.

GIBSON'S IMPROVED BENCH VISE.

Machinists and other workmen who use the vise in their business not unfrequently are much annoyed by the difficulty



of properly holding and retaining in the vise jaws wedged shaped pieces of work or other irregular forms. The jaws of the ordinary vise are parallel without any device for changing their relative positions. The invention, shown partly in section in the engraving, is an attempt to remedy this defect. It is readily understood both in construction and operation.

The outer jaw instead of being pivoted to the frame of the vise to swing in only one direction, has its lower end formed into a journal by which it may be turned in a box, which is pivoted by a bolt as is the foot of the outer jaw of the common vise. By this means the outer jaw can be placed at an angle, greater or less as may be desired, to the inner or fixed jaw. In order that the screw may be worked when the jaws are in this position, it is made in parts; one end of the screw being formed into a ball and the inner end of the lever knob having a similar ball, both of which are contained in a sleeve or socket and pinned through it at right angles one to the other. This makes what is known as a "universal joint" by which the screw may be operated in any position to hold firmly any object which may be placed between the jaws.

When it is desired to use the vise with the jaws parallel, a tapering pin connected to the vise is passed through the box in which the lower part of the movable jaw turns and through the journal of the jaw, making this portion of the vise as rigid as the ordinary vise.

Letters patent were procured May 14, 1867 by Charles R. Gibson, Madison, Ind., through the Scientific American Patent Agency, who will furnish all further particulars desired by interested parties.

The Early History of Silk Throwing.

Previous to the year 1718, the whole of the silk used in England was imported "thrown," or formed into various threads and twists, from Italy, where it was made by a secret process. About the year 1715, Sir Thomas Lombe, an Alderman of the City of London, dispatched his brother John to Italy to find out, by fair means or foul, the secret of the manufacture. John was furnished with ample means by his brother Thomas, and by a judicious use of the "oil of palms" and the adoption of various disguises, he succeeded in gaining admission to some silk mills in Piedmont. While acting the part of a careless observer or of a workman, he found opportunities of making sketches and even models of the machinery, together with notes of the process, and of becoming a skilled silk throwster. His real character was, however, ascertained, and he was obliged to fly to avoid assassination. Two Italian workmen accompanied him; and with their help, and the assistance of his models and notes, he commenced to make the machinery. He chose Derby as the scene of his operations, and having arranged with the corporation for an island on the river, he erected a mill, probably with his brother's money, at a cost of £30,000. The building is still in existence, and is known as the "old Silk Mill." In 1718, a patent was granted to his brother Thomas for the machinery; and the specification of this patent has just been brought to light after having been "lost" for more than fifty years.

The evidence before Parliament, on a petition for an extension, showed that the price of organzine had been reduced by 25 per cent in consequence of the introduction of Lombe's machinery, and also that the English had been enabled to compete with the Italians in their own country. The petitioner put in a copy of an Italian statute which made it death "to discover anything relating to the making the engines, or working the said organzine silk." The patent was not long prolonged, certain honorable members fearing lest a precedent should be established, but the inventor was rewarded by a grant of £14,000. Such is the history of probably the first attempt to obtain the renewal of a patent.

To return, however, to the unfortunate brother. The Italians were furious at the loss of their monopoly; and a woman was sent to Derby with orders to gain the two Italian workmen in Lombe's employ, and to compass the destruction of their master. According to Hutton a slow poison was administered, and Lombe died after two or three years of great agony, about the year 1724 or 1725.—*Mechanics' Magazine.*

HASTY PUDDING.—It does not appear to be commonly understood, and not even by Webster, that the above title has any other significance than the readiness with which the simple dish coarsely called "mush" is prepared. It has its origin in the vernacular of England, where the word "hasting" is used in the sense of stirring or agitating a liquid mass. As "hasty pudding" cannot be made with haste, unless it is to be eaten raw, but does require a good deal of hasting or stirring' the latter is probably the meaning of the name.

English vs. American Locomotives.

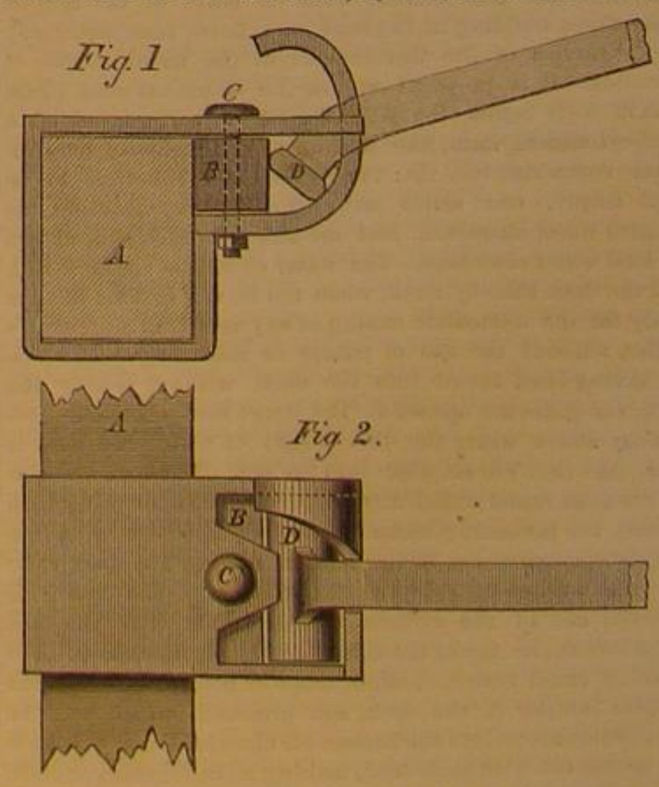
A practical mechanic of considerable experience in English shops, now employed in one of the leading locomotive works of this country furnishes us his observations on the relative merits of locomotive engines in the two countries. He first remarks on the greater nicety of the foreign finished work. Great care for example, is there taken that all double eyes shall fit exactly, not to be tight but so as to fit well and work easily. Bolts, such as are used for the eccentric rod, double eyes, etc., are held in place by washers ¼ or ⅜ thick with steel taper split pins, behind or running through bolt and washer, a plan as cheap and much safer he believes, than the one employed in some of our shops, of having simply a nut with no check to its coming off. It was formerly the custom in England, as it still is in this country, to put steel bushes into the holes of finished work, but the practice is now entirely discarded there, steel being welded on instead. In our locomotive works the connecting rod straps are too light for the key ways, a weakness which the English avoid by raising the strap around the key way, so that there is the same amount of metal there as elsewhere in the straps.

On the other hand the American locomotives surpass the English in many particulars. Take crank pins for example: in England they are turned taper and ground into their places very exactly, the holes being heated red, the pins shrunk in and riveted at the back; still they frequently become loose, while in this country they are turned parallel and forced in, sometimes not even riveted, yet they seldom fail to work well. English engines cannot run with such light finished work as they do here. In regard to the wheels: Stephenson's old engines with outside cylinders, have wrought iron spokes and cast iron hubs of a massive description, yet all cast iron wheel bosses are found to split so badly that it is customary to contract two wrought iron hoops around them, and as they are, with all these precautions, still liable to break, solid wrought iron wheels are in consequence the rule in England. The use of cast iron wheels is regarded by our correspondent as a great advantage enjoyed by us, and for it we are indebted to the superior qualities of our American iron.

We think our correspondent in error in regard to the use of split pins and check nuts. These or some equivalent device are extensively employed in our best shops. The practice of raising the metal around the key and gib slots on straps is quite common in this country. Tapering shank crank pins would hardly recommend themselves to intelligent American mechanics.

HERSEE'S IMPROVED THILL CLIP FOR VEHICLES.

The intention of this improvement is to furnish a ready means of attaching and detaching the thills or shafts from vehicles and of holding them in position while in use, without rattling and wear. The clip is of wrought or cast iron, forged or cast to fit the axle, A. The front portion of the clip curves outward, upward, and backward, forming a recess between its front and the block, B, which is of India rubber



and held in position by a bolt, C. The curved forward portion of the clip is cut away on one side for convenience of attaching and detaching as seen in Fig. 2. The thill iron is furnished at the end with a transverse piece, flattened in its cross section, seen at, D. When the forward end of the thill is depressed the transverse piece may be readily lifted from the clip, but when the thill is in position, as when attached to the horse, one edge of the transverse engages with the inside front of the clip and the other with the elastic rubber, as

seen in Fig. 1. This prevents all play and consequent wear, rendering the motion of the vehicle, so far as the thills are concerned, quite noiseless. It will be noticed in Fig. 2 that when the thill is in place one of the edges of the transverse piece on the end is under the projecting lip over the rubber block, and the thill is thus prevented from being casually or accidentally lifted from its place. With this device the thills can be removed from the carriage and a pole substituted in a moment to adapt the carriage for a span instead of one horse. By the readiness with which the removal of shafts or pole can be effected, the carriage takes up less room in a stable and they may be kept out of danger of breaking by being stepped upon or driven over.

A patent was issued through the Scientific American Patent Agency, for this improvement, May 21, 1867, to Thompson Hersee, Jr., 307 Main street, Buffalo, N. Y., who may be addressed for further particulars.

Science Familiarly Illustrated.

Insects.

All insects have six legs, unless they have met with accidents. They do not breathe through their mouths, but by means of a great number of little pipes which run through them lengthwise, having openings here and there on the sides of the body where the fresh air is drawn in. These little openings are very curiously contrived—in some cases protected by tiny trap-doors opening on hinges, in others having a strong grating over them of very coarse hairs. Hence, an insect when cut in two, as he does not use his mouth for breathing, and as his brain is not confined to his head but runs all through his body, will live for many hours in this mutilated state. In fact some insects never eat a mouthful after they are full grown.

Insects have from two to five eyes. Two large eyes called compound eyes, because they are made up of many little eyes united, like a bundle of six sided spy-glasses tied together, large at one end and very small at the other, and looking under the microscope, like the meshes of a very fine net. Then there are sometimes three little eyes in addition to the large ones, placed generally on the top of the head, although they occasionally vary their position.

All insects are provided with *antennæ*, which are those little, many-jointed projections extending from the head near the eyes somewhatlike reindeer's horns. These are probably used for feeling, smelling, and hearing with, although their uses have not been definitely settled. They vary much in appearance; sometimes resembling Indian clubs, sometimes fringed like a fir tree, notched like a saw, plumed like a feather, or armed with teeth like a comb. A few insects have no wings, others have two, others four, but none have more than that number.

Insects pass through several stages of existence before they become fully developed. Most of them are hatched from eggs; then they pass into the larva state, in which ther are caterpillar, maggot, or grub, according as they are to become butterfly or beetle. In course of time they go into pupa, or mummy state, from which they emerge ready for action as perfect insects. In some classes these destinctions are not so trongly marked.

On examining a fly with a microscope, you will find six legs, armed each with two sharp little toes; two big compound eyes covering nearly the whole of the head, and the three little eyes arranged in a triangle; two transparent wings strengthened by a net-work of veins, and covered with fine hairs to protect them from wear and tear; a pair of tiny winglets, and on each side of the body a little knob which serves for unknown purposes. On closer examination of his mouth you will find a proboscis or trunk, like an elephant's; this in nothing but the lower lip lengthened and armed with three lancets, with which it punctures its food, or exasperates bald-headed old gentlemen. The end of the lip is flattened and grooved like the bottom of a meat dish for gravy. He is provided with a fluid which running down little canals in his trunk, dissolves soluble substances, so that they are easily sucked up through the same little canals.

On examining the foot closely under the microscope you will see that it is armed with two little claws, protected by fleshy pads, covered with hairs. Each hair is enlarged at the end, making a little disk, which is kept moist by a fluid continually exuding. The little claws catch on the rough point of any surface, and the moment this is done, the little disks take hold by their edges, while their centers are retracted, leaving a vacuum, and thus creating an atmospheric pressure which sustains the insect against the force of gravitation While one foot is raised, the others retain their hold, and the rapid movement of the six legs along a ceiling, shows how swift is the instinctive action of this complex apparatus.

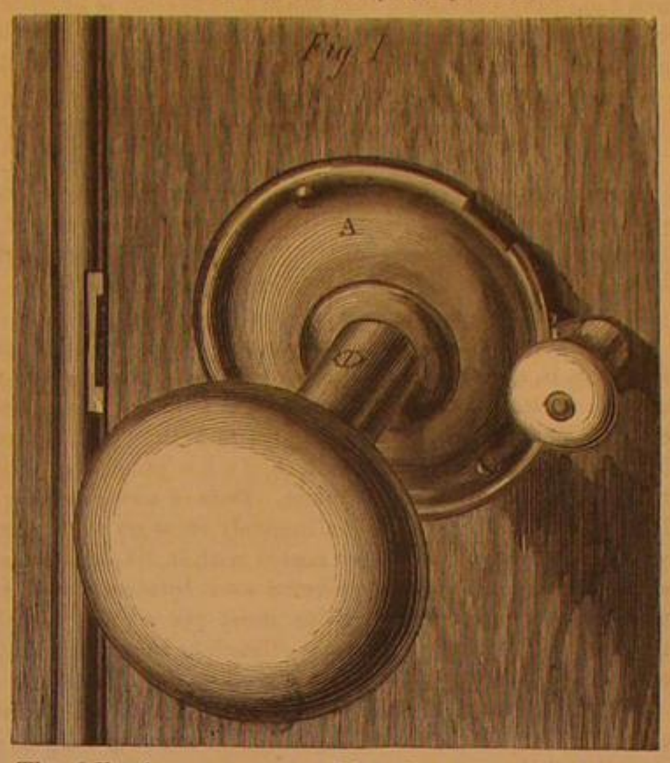
According to Kirby and Spence, the common house fly, when undisturbed, makes six hundred strokes with its wing in a second, and when necessary can increase its velocity six-fold.

There is one fact in the natural history of flies that is generally very little understood, and what is true of flies, is eqnally true with regard to all insects. It is that flies hatched into the winged state never grow any more, either smaller or larger. If he is hatched a small fly, small he remains all the days of his life. His growing and most of his eating, has been done in the larva or maggot state. Then he leads the life of a glutton, eating with apparent relish all most loathsome things, reveling in all sorts of impursties, waxing very fat and aldermanic, as do most large eaters in the human tribe. An old writer well observes, "How few of us are aware that all these creatures now buzzing above our heads once crawled beneath our feet!"—*Riverside Magazine.*

RICHARDSON'S PATENT LATCH FASTENER.

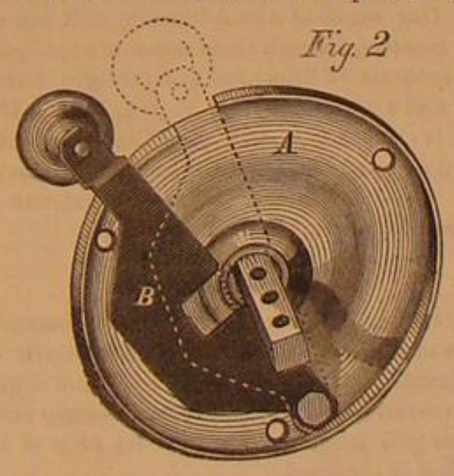
The subjoined engravings represent an improvement in mortise stop latches or locks, for which Letters Patent were issued to F. A. Richardson, of Poultney, Vt., Oct. 23, 1866.

The hardware trade has long felt the want of a mortise stop latch, something which should be simple, and at the same time effectual. More properly speaking it is a patent rose. When applied to a mortise latch, it renders it a perfect lock; for no person from the outside can possibly open the door. It will also be seen to be free from troubles hererofore existing in previous devices for fastening doors, inasmuch as it cannot in any case fasten itself, is perfectly simple, costs much less than the ordinary mortise latch and lock, and is free from the objections to the same for sleeping apartments.



The following are some of its advantages: 1. Its cost, as before stated. is much less than ordinary fastenings; 2. Its simplicity renders it less liable to get out of order; 3. It cannot be easily picked; 4. There is no key to be lost; 5. It is easy of adjustment and an ornament to a door; 6. It can be applied to any mortise latch or lock already on doors with very little expense.

The operation is as follows: Fig. 1 represents the inside of a door and casing, attached to which is a common mortise knob latch. Figs. 1 and 2, A, is a metal rose or washer of the usual construction, only made a little deeper in order to receive the stop, B, Fig. 2, which is made of steel, and fastened to the rose at one end by a rivet in a manner to allow it to move freely. The stop is bent slightly toward the rose before it is riveted on in order to keep it pressed up against the rose so that it will remain fastened when pushed up in place into



the upper notch. It is also bent up or necked at the end, Fig. 2, to prevent its touching the door when moved up or down, thereby not marring the paint or door. The stop has a recess or notch in it, as shown in Fig. 2, to receive and hold firmly from turning the knob shaft. On the necked end of the stop is a small knob, either porcelain or mineral, to correspond with the door knob. It is by this small knob that the stop is worked. The rim of the rose has two notches to hold the stop in its place when pushed up or down. It will be seen by Fig. 2 that by pushing up on the small knob the knob shaft is kept from turning.

For other information in regard to this invention, for specimens, for agencies, and for supplies, address Richardson & Holbrook, at Poultney, Vt., or at 73 Cornhill, Boston, Mass.

Treatment of Magnetic Iron Ore.

The smelting of this important ore, which is found in large quantities in many of the Southern and Western States, has not been carried on with sufficient energy, on account of the great expense in labor and fuel connected with the process. At present it is for these reasons impossible to manufacture iron in any of the Southern and Western States that are too far distant from the coal regions. In a recent interview with Mr. A. Thoma, who for a considerable time was a superintendent of iron works in Russia, Germany, and Asia, he described a process invented by him by which the iron can be produced with but little trouble and with a saving of from 50 to 75 per cent of labor and fuel. The invention, if it proves to fulfill what it promises, will be of the greatest advantage to all iron manufacturers in the United States, and parties interested in the business would do well to convince themselves of its merits.

The inventor, Mr. A. Thoma, is desirous of finding somebody to take an interest in the matter, and to aid him in bringing it into general use. He can be addressed at No. 85 Sixth street, New York City.

MACHINERY FOR CUTTING STONE AND TUNNELING.

While in nearly every branch of industry that man s hand has found to do, his ingenuity has devised important mechanical aids, no machinery, excepting of the most primitive character, has ever been employed in the cutting and working of stone for ornamental or building purposes, and to this cause alone, rather than its original cost at the quarry, or even the expense of transporting to market, is due its great value as a building material. An English exchange describes an invention lately introduced for cutting rock and working up stone so economically, that it anticipates in time a decided decline in the fabulous value now attached to brown stone or marble fronts.

This machinery may be variously applied, as for sawing blocks and slabs of considerable thickness; for facing the surface of squared-up stone in an ornamental manner; for tunneling and undercutting stone, coal or slate *in situ*; also, for the vertical cutting of the living rock almost as readily as a hay cutter cuts hay out of a stack. The main efficiency of the machine depends on the peculiar forms of the cutting tools or movable teeth. These are attached to holders, which are themselves fixed either in the edges of the blade, an improvement on the plan of making the blade serve as a cutting edge; or are applied to the circumference of cylinders, when used for surfacing. In consequence of being movable in their sockets, these tools are easily replaced as required, without any reduction in the diameter of the blade, a fault which so soon renders the circular saw when applied to the cutting of stone or slate, useless.

In working up stone in the rough, the slate or massive block is clamped to a table which, moving on friction pulleys, is fed forward by a self-acting screw, advancing upon the cutting blades at a speed of from three to six inches per minute. The cutting blades, from one to four in number, are fixed to collars which traverse at an angle above the table, supported by uprights and moved by a train of wheels in the usual manner. For cutting window sills, door posts, steps, coping stones and a host of other building materials out of rough blocks of slate—which formerly were thrown away as useless because no means for working them was known—four blades of four feet diameter are employed, and blocks fourteen inches thick, weighing several tuns, are simultaneously reduced to five thick slices, and are immediately split into the thickness required for planing or tooling, as most suitable.

For giving a finished surface to building or other stone of an ornamental character, where breadth not depth is to be cut, the axle itself, or a removable cylinder bolted to the axle, receives the tools which are placed spirally around it, so that a divided and regular pressure may come upon the face of the stone at intervals of two or three inches. Fluting, waving or running figures are produced at pleasure by having the table carrying the stone travel on rails or grooves correspondingly curved. A roughing tool imitates the marks of a pickax in rustic stonework, with the usually chiseled work around it. Some patterns of flat tooling by these machines can be made to imitate chisel work so closely as only to be distinguishable by the finer finish given by the machine.

For quarrying stone a new principle is claimed to have been introduced in this machine. The cutting tools, instead of being placed in a single row around the rim of a thin blade, are fixed in rows of twos and threes alternately across the margin of a wheel-like disk, so as to clear away a wider space. The outer portion of this disk is a ring of cast iron armed on the outside with tools and carrying an ordinary cog wheel within; a pinion meshes into that part of the inner cog wheel that is continually furthest from the rock. This cogged wheel has as its axis a broad metal plate of great strength and forming four-fifths of the diameter of the entire cutter. In a circular saw with a central axis, the blade can only penetrate to so much of its semi-diameter as is clear of the axle and collar. But this arrangement allows the cutter wheel to be buried in the cut up to the point at which it is held, and practically a cutter three feet four inches in diameter enters the rock to the depth of two feet three inches. Parallel cuts having been made, the rock between is got out by blasting, or if there is any cleavage or layering, it may be wedged up from below.

These machines are extensively used in Wales, and in England a gigantic one, having two blades of thirteen feet diameter each, has been put up at South Shields, by the Commissioners of the Tyne Navigation, for cutting the limestone of the vicinity for the harbor works, and the success attending their working so far induces the belief that a really valuable acquisition has been made in these machines.

CURRENT RECIPES.

MODELING CLAY moistened with glycerine, is recommended for all the qualities of wax except expensiveness and susceptibility to changes of temperature. The clay must first be perfectly dried.

CLEANSING CASKS BY FIRE, is a cheap, short and effectual mode much in use in some parts of the world. Rancid pork, lard and butter casks, may be purified by burning straw or shavings in them.

DULL BLACK ON BRASS is obtained by rubbing the surface first with tripoli and then washing it with a solution of one part neutral nitrate of tin with two parts chloride of gold. After ten minutes wipe it off with a wet cloth.

TO WASH CALICO WITHOUT FADING.—Infuse three gills of salt in four quarts of water; put the calico in while hot, and leave it till cold, and in this way the colors are rendered permanent, and will not fade by subsequent washing.

Correspondence.

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

River Embankments---The Mississippi Levees.

MESSRS. EDITORS.—My attention has been attracted by a recent article in your paper on the subject of levees on the Mississippi river. You very justly remark, that these are works of a national character, claiming the aid of the general government, both on account of their magnitude and the importance of uniformity of plans of construction, and the adoption of a system of superintendence that will ensure the greatest care and vigilence in protecting works of such extent, upon the entire preservation of which, depend interests in which our whole country is more or less concerned. We are all affected by the rise or fall in the price of cotton and sugar—so we are, by the cost of wheat, beef, and corn, but these latter, can be produced in nearly every section of our country—sugar and cotton can only be raised profitably in the genial climate of the South; hence those fertile regions in some sense may be regarded as the common inheritance of the nation and especially demanding its care and protection.

But my principal object in calling your attention again to this matter, was to make a suggestion in regard to the better mode of constructing these levees. Having been engaged for many years in the construction of dams, reservoirs and canal embankments, I can speak with confidence in regard to structures intended to resist the action of water. Mr. G. W. R. Bayley's plan, which I have noticed, embraces many good features, but upon the whole, it appears to me objectionable. Mr. B. seems not to have made an estimate of the probable cost of his plan, and therefore I think his impressions are very far below the mark. It would certainly be very expensive; but he justly remarks that "security and safety, should be the measure of economy." I have had much experience with structures composed largely of timber and plank, exposed to the weather, and therefore to rapid decay, and I do not think they are either secure or economical. In my judgement plans should be adopted, not too expensive, involving the use of as little perishable material as possible.

If I had a contract for constructing the levees of the Mississippi now, and maintaining them for twenty-five, or fifty years, I would make embankments ten feet wide on top, with slopes on both sides, of two feet base to one foot rise, and in hight five or six feet above the highest floods. Before commencing the embankment, for a space of ten feet in width under the center of the bank, about one foot in depth of the porous soil should be stripped off and deposited in the slope. Then a ditch four feet wide and three feet deep, should be cut in the center extending the whole length of the embankment. In the center of this ditch, I would set up endwise, close together, two inch planks of sufficient length to reach one foot above high water, securing their edges evenly together by nailing on battens.

The embankment may then be carefully made, keeping the more open and porous material in the slopes. The plank thus posited, would effectually stop leaks from muskrats and crawfish, and being entirely covered up and excluded from the air, would last very many years. The outer slope should be protected with stone, where they can be had at reasonable cost, but generally willows, or any shrub of southern growth, which roots well, may be used with great advantage.

Terre Haute, Ind. W. J. B.

Trades Unions.

MESSRS. EDITORS:—Allow me to say a few words in your journal on this subject, for I am confident, that from personal knowledge, I can show the working of these "unions" in a clearer light than mere theorists. The arguments I advance are supported by indisputable facts. I am an English mechanic, and belong to no trades protection society, not believing in them or their principles. But let me add, under existing circumstances, I do not utterly condemn them, although I have had every provocation from them in my native land. Fortunately trades unions are not yet very numerous in America, and if employers and workmen are wise they will never be.

The main object of a trades union is to protect the interests of the workmen by keeping up their rate of pay, reducing the hours of labor, and, in short, getting every possible advantage out of the employers, while forcing them to pay as much to an inferior as to a good workman. This statement is proved by referring to the late engineer's strike on the London and Brighton railway, where the dispute was narrowed down to a demand by the men that all engineers of so many years standing should be paid an equal rate per day. Now in all cases, the demand for an article determines its value, and it is as unfair for the artisans to combine to raise the value of their labor as it would be in the employers to join to depress wages, or the storekeepers to club together to raise the price of provisions above their natural value. Besides, such combinations tend, if successful, to limit trade, because increasing the cost of an article decreases its use, as persons cannot afford to buy it. Trade societies make another great error in opposing piece work, which, I contend, is the only true way of paying a workman fairly for the amount of labor he performs. It is simply absurd to pay a man for the amount of time he spends in the works instead of for the work he performs, and it is a curious fact that the time system only applies to labor performed. If a butcher was to send in his bill for one hour for delivering a leg of mutton, he would naturally be laughed at. It is altogether a wrong idea to pay for time; pay rather for the amount of work delivered. Now suppose two workmen enter a shop, and one getting piece-work earns say double pay; the other does as much work, but not doing piece-work, only receives day-pay. This is unjust, as it does not give the skillful workman a chance. The course pursued in many large shops in England is, in many respects very fair to the skillful workman; it is this: the bosses go to the best workmen of the establishment and ask them to tender for the work per piece; the lowest tender is accepted. When finished, the work is taken to pieces, examined, and if well done, passed. If not satisfactory the boss stops part payment, and has to be done over again.

The only evil of this system I found to be this, employers do not make sufficient allowance for the difference in skill.

It was in an establishment managed in this way that I became acquainted with the beauties of the trades union system, and personal experience and observation convinced me of the despotic antipathy they exercised toward the skilled laborer, and I am fully convinced that the whole system is manifestly unfair, and so long as it is pursued I can scarcely be surprised at trades unions resisting piece work. J. R.

Paterson, N. J.

The Uses of Aluminium.

MESSRS. EDITORS:—Our knowledge of the highly valuable properties of the new metal Aluminium will soon lead, I trust, to its more facile production when its vast superiority over iron and steel will be fully developed and be made especially manifest in shipping and heavy artillery.

Its toughness, lightness, and incorrodible qualities eminently fit it, either pure or alloyed with other metals, for naval and military purposes. Small arms will bear the highest charges of powder without injury, and they are scarcely heavier than wood, and the cuirass of a few ounces in weight resists a pistol ball at short range. Beds of axles moving at high velocities for weeks continuously show no evidences of wear, and sheets of iron when coated with it, like tin, present a smooth surface in no way affected even by strong acid, and which for the sheathing of ships must prove more valuable than copper, and may perhaps be efficacious in the prevention of fouling.

When the metal can be produced in quantity by economical processes (which I have no doubt will ere very long be accomplished through the aids of chemistry and electricity), the largest guns will be turned out, weighing little more than our six-pounders; indeed, if an interior tubing could now be fixed of some inches in thickness, our largest guns might be considerably reduced in size and weight; and since the light cuirass proves its powers of resisting a ball, a vessel armored with far less thickess of metal might prove perfectly protected, while the weight would scarcely exceed that of teak, and if its specific gravity is correctly given, three or four large guns would not weigh more than one of our iron or steel monsters.

French and English metallurgists speak confidently of its value for all these purposes and many others, and I am most sanguine that our inexhaustible stores of aluminious earths will ere long be turned to good account by the company in course of formation in America. A fine field is open to skill and energy. Our muffs at the Admiralty will not stir a finger in such matters, though their noses always point westward when subjects of this kind are brought before them. This I know, and I address myself to you, hoping if you find my statements correct you will give the subject the aid of your powerful pen and cast it on the waters for fructification.

THOMAS INGLE.

The Villetta, Ensworth, Hauts, England.

Street Pavements.

MESSRS. EDITORS:—Your important suggestions to theoretical inventors of street pavements are particularly valuable to future aspirants in that line, for we need and must have a good and comparatively inexpensive and lasting street pavement, and this will bring out an unusual crop of inventors until the object is obtained.

Although asphaltum compounds have stood the test for thousands of years without detriment, [see mummies, courts, etc., in Egypt and other places], and in combination with sand, gravel, etc., in modern times, as street pavements, docks, parade grounds and walks, with perfect success under the attrition of immense traffic for thirty-five years, as in Paris, and for seventeen years at the Horse Guards in London, without disintegration; yet in more modern times they have been failures, such as the blocks in Memphis, Tenn., Regent and Oxford streets, London, yards of Cincinnati, gas-works, Ohio, Rue de Paix, France, and yet the projectors of them say the ingredients and proportions are the same as the older ones of France and England. Why do modern asphaltum compounds disintegrate and crumble? I will give your readers my experience—dearly paid for—so that others may profit by my failures.

In 1847, on my return from France and England (during my stay I examined the pavements, etc, in Paris and London, and brought specimens of them to analyze) I experimented practically by subjecting my compound pets to the action of a crowded street, for several years; I recorded all my attempts, very minutely—date, ingredients, variations of temperature, time under treatment, etc., and after eleven years of experiments with what appeared success in every instance, up to a certain period, there were ten complete failures. When the tests were continued for three and four years they would, previous to that length of time, disintegrate; but for several months, some for over two years, bade fair to be reliable, good, permanent pavements, and nine of them are, at the end of twelve months, recorded as good. Yet they were all failures but the eleventh; and I found out the cause. It is not in the proportions of asphaltum, sand, etc., but it is due to the degree of heat at time of incorporation. A few blocks marked No. 3, composed precisely the same as Nos. 1 and 2, were laid down in front of Mark & Co.'s ice depot, Cincinnati, Ohio, in 1857; in 1859 they were taken up, and placed in the office of the *Scientific Artizan*; in 1860 they were put down at the railroad depot, West Point, Ga., and in 1861 they were as good as when first put down in 1857. The others, Nos. 1 and 2, placed alongside, made from the same ingredients and in the same proportions; but without any regard to degree of heat, crumbled away in 1859. The evidence is conclusive that all asphaltum pavements must be carefully managed as regards a certain degree of heat; and I have no doubt, if I had not been financially ruined by the war, many of our cities would be now paved with beautiful noiseless asphaltum pavement, without dust, and in a sanitary point of view, pre-eminent on account of its solidity and entire freedom from cracks and holes,

ALBANY PACKHAM.

Carrollton, Ky.

A Suggestion for Managers of Agricultural Fairs.

MESSRS. EDITORS:—We are now approaching the season when cattle fairs, strawberry festivals and other gatherings of a similar nature are in fashion. It has been the custom in the award of prizes at these exhibitions to consider with the greatest favor those farmers who have produced the *biggest* fruit, or cattle, or other product of the field or pasture. It seems to me that this system has not been productive of the best results. The constant tendency of every thing we eat has been upward for some years past, even before the war had operated to raise the price of labor and all materials used in agriculture, and the system I speak of above has tended to still further inflate the market. I have to suggest that a new experiment be tried, of awarding the premiums to him who produces off a given area the *greatest quantity* of fruit or vegetables, the only condition being that the fruit, etc., competing for prizes be all marketable, or good of its kind. I am not a practical fruit grower, but I have been told that this big fruit—strawberries, for instance—is only produced by the sacrifice of many of the smaller blossoms on the plant, and the consequent destruction of nearly as many berries. Does not the same rule hold in the cultivation of apples, pears, etc.? The importance of our having an abundant supply of good fruit and vegetables cannot be over estimated, though Dr. Graham finds few followers at the present day. If then, farmers are urged to compete for prizes to be awarded to the greatest producers, it is fair to presume that a greater quantity will be put on the market, and the fruit consequently at a lower figure: the farmers, I think, would not be the losers in "the long run." The same remarks apply with equal force to the raising of cattle; for though the breeder may not kill off his smaller calves to produce one big yoke of oxen yet these monstrous creatures which one is called upon at our annual cattle shows to admire, are oftentimes only raised by an immense amount of care and expensive labor. Can you not call the attention of the agricultural world in general, and that portion of the public press devoted to the interests of farmers in particular, to this matter, before the directors of the societies in the different sections of the country have promulgated their official lists of awards and premiums?

"CONSTANT READER.

Boston, Mass.

Governor Expansion Cut-offs.

MESSRS. EDITORS:—Having perused your journal of the 11th of last month, my attention was called to a description of the Dickinson Combination Governor and Variable Cut-off, and as I have made the steam engine my practical study for a number of years, I would ask permission through your valuable journal to lightly touch this subject so often commented upon.

Having examined the drawings and specifications of the above governor, I am prepared to say that it is very well adapted for the purpose intended, and is well worthy of the highest approbation. Leaving the rest for the more competent to decide, allow me to state the result of a few trials I have made upon the mode of working steam expansively at our works in Philadelphia, during the past six or eight months. They are thus:—Placing a chest, as usual, containing an alternate induction Nightingale valve, having its face pocketed longitudinally for the transmission of refuse steam, transversely over the center of the cylinder, and arranging it with a double trip motion operating the valve, admitting the steam to the opposite ends of the engine cylinder, in combination with an independent rocker connected with the eccentric in the usual way. The tripping pieces being under the control of a governor, or other suitable means of regulation, whereby the induction of steam is enabled to be effected in a positive manner at the commencement of the stroke of the piston, and the cutting off being thus enabled to be effected at various points of the stroke. This construction works very well, but is, in my estimation, not as efficient as the Nightingale arrangement, as in the latter the cylinder is entirely clear of waste steam in the port.

Another, but more simple mode of obtaining expansion, but only to a moderate effect, is, by attaching permanently to the shaft of the valve a rocker, slotted for the reception of a pin or other suitable means of adjustment, from the extremity of the eccentric rod, the pin being attached to and under the control of a governor, the relative position of the balls increasing or diminishing the leverage on the valve, thus forming a cut-off at different points of the stroke. But this mode is not as perfect as the former, as the movement of the valve is entirely dependent upon the motion of the cam. Where there is steady motion required, it may become necessary to make a few trifling adjustments for the prevention of accidents.

There being so many different minds and notions relative to the practical method of working expansion, I have thus

far decided to write this article for the SCIENTIFIC. The differences of opinion are vast, some pretending to say, that to work steam expansively requires ten or fifteen per cent. more coal than to follow full stroke. I have tried it, and have found it to be an advantage, and shall continue to promulgate the doctrine until I am convinced to the contrary.

Yours, R. S. D.

Reading, Pa., June, 1867.

Recent American and Foreign Patents.

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

WASHING MACHINE.—Alexander Brooks, Waverly, N. Y.—This invention has for its object to furnish an improved washing machine so constructed and arranged as to wash the clothes rapidly, thoroughly and conveniently and without injury to the fabric.

ADJUSTABLE PARALLEL VISE.—O. V. Flora, Madison, Ind.—This invention has for its object to furnish an improved vise which can be readily and quickly adjusted to the size of the object to be held, and which will adjust itself to the shape of the object to be held whether its sides be parallel or inclined.

CLOTHES DRYER.—Reubin Hamblin, Mishawaka, Ind.—This invention has for its object to furnish an improved apparatus for drying clothes by means of which a large drying surface may be supplied while occupying a small amount of space.

LIFE PRESERVER.—John Golding, New York City.—This invention relates to a device by which matresses can be connected to form floats for the purpose of saving the lives of shipwrecked passengers. The invention consists in the application and attachment to the ends and sides of matresses of snap hooks and eyes or loops whereby a number of matresses can be instantaneously connected into one floating structure, upon which a number of persons can find temporary supports with a sufficient quantity of provisions and other necessities.

BELTING.—C. J. Fay, Philadelphia, Pa.—This invention relates to the use of paper made of manilla, hemp or grass, for the purpose of belting of any description for machinery, etc., and also for harnesses and other similar purposes.

MACHINE FOR FORMING SPOKES.—C. C. Dupue, Wayne, Mich.—This invention has for its object to furnish a cheap and durable machine that can be run with one horse power or by hand, and which will finish a spoke at one operation.

HINGE.—Wm. Webb, Waterbury, Conn.—This hinge is especially designed for coal oil lamps, and is so constructed as to produce a stop or rest for the chimney holder as it is swung away from the wick tube.

LAMPS.—E. D. Norton, Bradford, Pa.—This invention consists in combining with lamps, a safety valve of a novel construction through which the gases formed in the lamp, can escape as fast as generated, and thus all possibility of an explosion be obviated.

MACHINE FOR MEASURING AND LAPPING TAPE AND BRAID.—Wm. Rhodes Arnold, Providence, R. I.—The object of this invention is to measure tape, braid, binding or other similar goods into exact lengths for the trade, say in pieces five yards long, and at the same time form them into sticks by lapping or folding.

CARRIAGES.—Caleb Condemaun, Hornellsville, N. Y.—This invention consists in securing or suspending the body of the buggy, to the axles by and through the means of springs applied in a novel manner whereby many advantages are secured.

COMBINATION OF SPRINGS AND HINGE FOR DOORS AND WINDOW BLINDS, ETC.—Alvah Wiswell, New York.—This invention consists in a novel and improved combination of a spring and hinge, as hereinbefore fully shown and described, whereby the spring is rendered subservient in keeping the door or blind in both an open and a closed state so as to render unnecessary the use of fastenings for that purpose, and also rendered capable of closing the door or blind after being partially opened and of being graduated so as to operate with a greater or less degree of strength as may be required.

APPARATUS FOR SUPPLYING AIR TO LIFE BOATS.—P. F. Schenck, Riceville, N. J.—The object of this invention is the saving of human life in case of ship wreck by supplying a life boat or vessel with fresh air for the respiration of passengers contained in the vessel which is otherwise hermetically sealed, while at the same time the sea water shall be effectually excluded.

MACHINE FOR DRESSING LEATHER.—Charles Korn, Wurtsborough, N. Y.—This invention consists in the arrangement of a clearer and sharpener by which each knife, which is secured to an endless apron, is cleaned and sharpened, after it has served to shave or whiten the skin of leather. The said sharpener and cleaner are combined in one sliding block, and are made self-acting and can be adjusted to knives of different sizes. When a knife has been cleaned and sharpened, the sliding block returns to position to operate the next knife, and so on, the whole device operating automatically.

CUT-OFF CONNECTION FOR STEAM ENGINES.—T. S. Davis, Jersey City, N. J.—This invention consists in the use of a scroll or inclined plane, actuated by the governor in combination with a bar or rod or its equivalent, arranged to operate in connection with the ordinary link or other valve or cut off motion and in a plane or direction at a right angle or nearly so, to and against the said scroll or inclined plane whereby the governor is given the power or means requisite to overcome and hold steady the link under all circumstances of friction slip of block, etc., as by the connection between the link and scroll or inclined plane, the thrust of such connection is taken up on the faces of the said incline or scroll, consequently preventing all vibration of the balls of the governor, except what is directly due to an increase or decrease in the speed of the engine.

LATHE FOR TURNING AND CUTTING SQUARE AND BEADED WORK.—Frederick Baldwin, Brattleboro, Vt.—This invention consists in the employment or use of rotating cutters in connection with a rotating pattern, a hollow stationary mandrel, and feeding device, the several parts being made to work automatically, whereby a machine is obtained capable of being operated rapidly and at the same time performing its work in the most perfect manner.

BRICK MACHINE.—Jonathan Mills, Des Moines City, Iowa.—This invention relates to the construction and to the general arrangements of the parts of a brick machine whereby many of the objections which have hitherto been met with in the manufacture of brick, are overcome.

METHOD OF CONDENSING FOUL VAPORS.—Samuel Davis, New York City.—This improvement relates to the manner in which the steam and vapor generated in fat boiling and other processes of a similar nature are condensed and rendered harmless.

COMPOUND FOR TEMPERING STEEL TOOLS.—William G. Esser, Milwaukee, Wis.—The object of this invention is to furnish a compound for tempering stone cutters' tools and especially mill picks so that they shall be much more durable than when tempered in the ordinary manner.

WAGON SPRING.—John G. Ostrom and Garret C. Landsing, Rhinebeck, N. Y. Patented June 11, 1867.—The object of this invention is to provide a very simple and cheap but a very elastic spring or rather set of springs for wagons and sleighs, and the invention consists in arranging a series of pairs of flat wooden springs each pair being laid at right angles across the pair above so that the more sets of springs are applied the greater will be the elasticity of the whole.

INSULATOR FOR TELEGRAPH WIRES.—Alfred B. Day, Oak Creek, Wis.—The object of this invention is to provide an insulator for telegraph wires with a dead air chamber by combining a wooden plug, a number of glass lugs and a wooden disk in such a manner with a cast-iron shell that only a very small orifice is left around the pin hook for the atmosphere to enter, and any moisture entering by that orifice will, by reason of the lower temperature of the iron shell condense and settle thereon leaving the wooden plug and the glass lugs very nearly in a dry and non-conducting state.

MACHINE FOR COATING HATS.—J. F. Mathias and D. M. Legat, Paris, France.—This invention relates to a machine for feltering hats in which the hats are fitted upon suitable supports arranged upon a revolving shaft, the material being thrown upon them by means of a fan, the whole being encased in an air-tight box.

CLOTHES BAR.—Hosea Willard, Vergennes, Vt.—This invention relates to a new and improved clothes bar for holding clothes for drying and is an improvement on a device for a similar purpose for which Letters Patent were granted this inventor bearing date Feb. 18, 1862. The original invention has its bars applied to the bracket in such a manner that they can, when not desired for use, be folded upward only, and the within-described invention consists in applying the bars to the brackets in such a manner that they can be folded either upward or downward as desired, and which is an improvement from the fact that in many instances the bars when folded upward are very inconvenient to reach and in that case may be folded or turned downward.

AMALGAMATOR.—R. W. Howard, Warwick, R. I.—This invention relates to a new and improved device for amalgamating gold and silver and it consists of a revolving or rotating pan placed within a stationary or fixed one the former having its exterior provided with spiral flanges and the bottom of the stationary or fixed pan provided with a gutter or trough at its edge whereby the pulp or crushed quartz is kept in contact and thoroughly incorporated with the quicksilver and the latter amalgamated with all the precious metal contained in the former.

ESCAPEMENT FOR TIME PIECES.—Hermann Reinecke, New York City.—This invention relates to mechanism which combines the advantages of the detached escapement with the lever escapement, the balance being so arranged that it receives an impulse from the escape wheel while it swings in one direction only, while it is perfectly free from the power of the mainspring during the other half of its motion and the impulse produced by the escape wheel is transmitted to the balance by means of a lever.

NIPPLE SHIELD.—C. H. Wilder and J. M. Wilder, New York City.—This invention consists in the arrangement of a screen in combination with a nipple shield in such a manner that by said screen the nipple is prevented from being drawn out any further than desirable and the usefulness of the nipple shield is materially improved. The screen is made adjustable so that its position can be regulated to correspond to nipples of different sizes.

DOUBLE SEAMING MACHINE.—John Rupp, New York City.—This invention relates to a machine which serves to attach the bottom to a kettle, pot or other vessel of a cylindrical, conical or other desirable form or shape. Said vessel is placed in a reverse direction on a disk from the center of which rises an adjustable standard intended to support the circular blank of the bottom. The blank is held in a concentric position by the lowest speeds of three or more cone rollers and by the action of the successive shoulders of said cone rollers in combination with suitable burring rollers the operation double seaming is accomplished, the disk which supports the body of the vessel being mounted on a vertical shaft to which a revolving and also a rising and falling motion can be imparted.

BUTTON FASTENING.—Benjamin Moser and David Yellott, Brooklyn, N. Y.—This invention relates to an attachment for buttons, studs, etc., whereby they can be so secured to the clothing as to render it impossible for them to be lost.

MANUFACTURE OF ORNAMENTAL FEATHERS.—Frederick Emil Schmidt Hoboken, N. J.—This invention relates to a new manner of coloring feathers so that the same may be prepared for the market, and be used on ladies' and children's wearing apparel and for other ornamental purposes.

BURGLAR ALARM.—Henry R. Robbins, Baltimore, Md.—Patented June 18, 1867.—This invention consists of two spring piston hammers, so arranged as to be released by the opening door, which touches the trigger and causes them to explode the caps. The nipple has a projecting point, and the hammer a corresponding depression, to secure explosion. The instrument is attached to the door jamb by penetrating points or by hooks.

COMBINED SEED AND GUANO PLANTER.—Thomas W. White, Milledgeville, Ga.—Patented June 18, 1867.—This invention has for its object the construction of an instrument which may be used either as a common plow or for sowing guano or planting cotton, seed, corn, peas, etc, and which shall be light, simple, cheap, and durable.

COMBINED COTTON PLOW, IRON TURNER PLOW, AND SCRAPER.—T. P. Warren, Norfolk, Va.—Patented June 18, 1867.—The object of my invention is the construction of an instrument which, with slight and easily made changes, can be used as a cotton plow, an iron turner plow, or a scraper, at the pleasure of the operator.

BOLT TRIMMER.—Henry Howe, Oneonta, N. Y.—This invention relates to an improvement in bolt trimmers, and consists of two bars of iron or steel, flattened at one end and pivoted together, the lower bar having a hole in its flat end to hold the nut while the cam-shaped sharply-beveled flat end of the upper bar is forced over it.

PESSARY.—W. G. Grant, Clyde, Ohio.—This invention consists in making a pessary hollow, and of such an internal shape as to fit about and encase the neck to the uterus when placed thereon, and of a conical or tapering shape upon its outside, whereby it can be the more easily inserted or withdrawn according as may be desired, and, when worn, rendered the more comfortable and agreeable in feeling to the person or wearer.

SPECTACLES.—George D. Edmondson, Watkins, N. Y.—Patented June 18 1867.—Each lens consists of two pieces of different magnifying powers, and let in different planes. The line of division between the two is the horizontal mid section, the upper portion is of greater focal distance for viewing more distant objects. The plane of the upper portion is at right angles to that of the bows, and at almost the same angle to the axis of the eyes when adjusted horizontally, the plane of the lower halves is inclined to the former so as to be about at right angles to the axis of the eyes when declined in reading, etc.

BEADSTEAD FASTENING.—Jeremy B. Wardwell, Georgetown, D. C.—Patented June 18, 1867.—This invention consists of the dovetail tenon on the end of the rail, being received within a mortise plate on the post; one side of the mortise rotates to open or close it upon the tenon.

PRINTER'S INK.—Moritzruos Weissberger, St. Paul, Minnesota.—Patented June 18, 1867.—This invention consists in combining the mineral resin found in the neighborhood of Petroleum, Ritchie County, West Virginia, in due proportions with the mineral lubricating oil pumped from wells near Parkersburg, West Va., and with lampblack, forming several varieties of excellent printers' ink.

BRAKES FOR WAGONS AND OTHER VEHICLES.—George S. Zeigenfuss, Doylestown, Pennsylvania.—This invention relates to an improvement in brakes for wagons and other vehicles, and consists in an arrangement for locking the wheels from the top of a load or side or rear of the vehicle, or from two or more of the said positions upon the vehicle together, as may be most convenient, independently of each other.

FURNACES FOR BURNING PYRITES WITHOUT THE AID OF FUEL.—John Hughes, Edgewater, N. Y.—This invention relates to a new and improved plan of construction of furnaces or kilns for burning iron or other pyrites to expel the sulphur either for the purpose of utilizing it in the manufacture of sulphuric acid, or for extracting the metals which may be associated with the mineral. The pyrites are burnt in my improved furnace without the aid of fuel to maintain combustion after the fire has been started with coke or other suitable kindling stuff by the ignition of the sulphur alone.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Planing Mill and Sash, Door, and Blind Factory Wanted. Address A. P. Smith, Sterling, Ill.

Jos. Lees, 285 Avenue B, New York City, alleges that he has valuable improvements in manufacturing gas from coal, and he wishes to engage with some company where his services may be appreciated.

Rolling Mill Manager Wanted—Competent persons desiring a situation will address with references Marshall P. Smith, Baltimore, Md.

Wanted—Experienced agents to sell the rights of our Clothes Drier patented Jan. 22, 1867, and illustrated in the SCIENTIFIC AMERICAN of April 13th. 55 per cent will be given to good agents. Address patentees Seeman & Catrow.

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 advertisements at 50 cents a line, under the head of "Business and Personal."

R. L., of Pa.—The magnetic needle is often used with success in searching for iron ore. It should be 5 or 6 inches long and be so suspended that it may be free to dip. The needle, however, is effected only by magnetic ores.

C. S., of Mich.—"With what velocity does steam pass from the boiler to the cylinder, the pipe being 4 inches in diameter and 15 feet long?" The velocity depends upon the amount of steam used by the engine. If the engine takes a pipe full in a minute, the velocity is 15 feet per minute; if a pipe full in 10 seconds, it is 90 feet per minute, etc. The old engineers who propound this question to C. S. are perhaps thereby poking fun at him.

W. G. R., of N. Y.—A copper color is given to small iron castings by well cleaning them in dilute acid, rinsing in water, and dipping in weak solution of sulphate of copper, or tumbling in saw dust moistened with the solution of sulpnate of copper. After the coppering the goods must be well rinsed in water. The film of copper secured in this way is exceedingly thin and will not bear much rubbing.

G. N. T., of N. Y.—The device for hanging yard gates so that they shall close by their gravity is quite common. It may be seen in almost every large village.

G. C. C., of Md.—"Will a current of air forced through hot oil or lard in bulk, reduce the temperature of the oil or lard below that of the air"? No. Singular question!

M. B., of O.—There is great confusion in the United States in the matter of weights and measures. Congress in 1830 revised the subject and authorized a system to be followed at the custom houses and other federal institutions. Many of the States have adopted the national standards, but among the others there is no uniformity. The national gallon is of the capacity of 230 cubic inches, and this is the only gallon which is recognized by the U. S. authorities. Besides this there are in use at least four other measures of different capacities called gallons. The adoption of the metric system is the easy way of escaping from the perplexities of the present systems.

A. B. N., of Mass.—We are not aware that any use is made in practice, of the decomposition of water by electricity. It is in fact one of the most expensive methods of obtaining the elements of water.

F. V. R., of N. Y.—You can give india-rubber a coating of gutta-percha, by dissolving the gutta-percha in a volatile solvent like bisulphide of carbon, and applying the solution in the manner of a varnish

P. Y., of Wis.—Your third communication on The Crank Motion is received and with the others placed upon file. We consider the subject has been sufficiently ventilated in these columns and disagree with you in the opinion that your article would be read by many with interest. The whole subject was ventilated in our columns at least ten years ago, and we do not care to reproduce time after time, projects which after the lapse of ten or a dozen years have brought forth no practical results.

W. H. A., of S. C.—The glaze of pottery is a glass which is a little more fusible than the ware. The composition of the glaze and the manner of putting it on should vary with the use to which the ware is to be put. A potter therefore should understand the properties of the ingredients employed in glazes, and should be able to determine the proportions in which he should use them.

R. M., of Pa.—The weight of a bushel of bituminous coal as established by statute in your state is 80 lbs. avoirdupois; of cannel coal 70 lbs.

W. R. S., of Pa.—Ordinary or saturated steam will be condensed to water by any increase of pressure, or diminution of heat. Superheated steam is ordinary steam which has been further heated, and maintains its elastic condition under increased pressure in proportion to the amount of over heating.

D. B. T., of O.—Pressure and temperature have practically no effect on the specific heat of air or water. In solids the increase of specific heat by increase of volume or temperature is quite notable, and it is likely that the same causes will increase the specific heat of air and water, but it is known that the increase is so small that it can never be accurately determined by direct experiment.

T. R., of N. Y.—Ink stains may be removed by applying a weak solution of oxalic acid. Care should be taken to wash out also the excess of acid as it is corrosive to organize matter. . . . The sun happens to be nearer to the earth in winter than in summer, and the reason that we feel less of his heat in winter is, that the rays strike the atmosphere at a smaller angle and are consequently reflected off into space. . . . It is a commendable practice to heat crucibles very gradually. Careful operators will get about twice as much service out of crucibles, as those who put them cold or damp directly into an intense fire.

A. L., of N. Y.—Coal tar pitch (the residuum of coal tar distillation,) is one of the most approved roofing materials. It is most often used in combination with felt or paper. A shingle roof is rendered more durable by painting it with coal tar. The preservative substance of the tar is carbolic acid, which being volatile is not retained in the pitch. But remember that a shingle roof is more combustible when coated with tar.

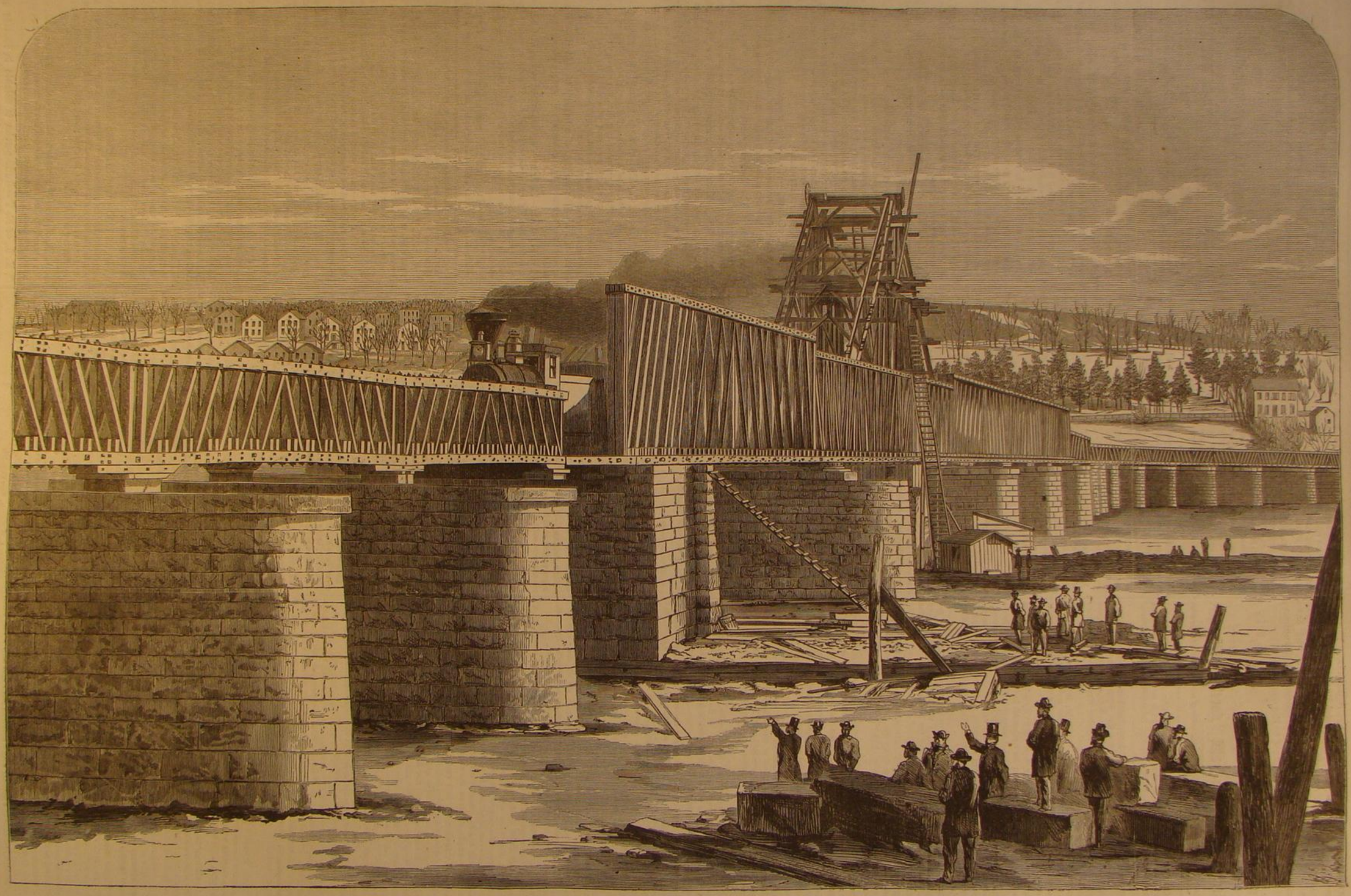
W. C. G., of Iowa.—The heating power of a battery is proportioned to the size of its plates, while the physiological effect is proportioned to the number of pairs of plates. We would not venture upon advice as to size, construction, and cost of a battery for heating purposes without knowing the details of the use. You wish to heat a strip of platinum. Is the strip exposed to a current of air? Is it to be brought into contact with any liquid or solid substance?

E. B., of Pa., has a wall which is so damp that paper pasted on it will peel off, and wishes to know if silicate of soda will render it water proof. An application of silicate no doubt will improve the wall and especially if it be of limestone, and we advise him to try it. But it cannot be expected that the process will be as thoroughly effectual as the ordinary lath and plaster.

W. B., of Wis.—In melting zinc care should be taken that it does not oxidise by overheating or by too much exposure to the air. It is a good plan to keep the surface of the molten metal covered with fine charcoal or sawdust. You can improve your injured metal by remelting and stirring saw dust into it.

R. A. D., of Wis.—"People out here claim that a raft of lumber will travel faster than the current, and that a raft of logs will go faster than the lumber." People have strange ideas out there.

G. K. S., of N. Y.—Gutta-percha is soluble in benzole and turpentine, and shellac in alcohol, but the two solutions do not mix kindly. A good common solvent of shellac and rubber, or gutta-percha, is still a desideratum.



THE GREAT RAILROAD BRIDGE OVER THE HUDSON RIVER AT ALBANY. [SEE NEXT PAGE.]

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

☞ 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 on them will be promptly attended to.

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VOL. XVII., No. 1....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, JULY 6, 1867.

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BINDING.—Subscribers wishing their volumes of the SCIENTIFIC AMERICAN bound can have them neatly done at this office. Price $1.50.

MACHINERY IN THEATRICAL REPRESENTATIONS.

The term "machinist" may by some of our mechanical readers be considered as misapplied when used to denote the builder and manager of the contrivances employed behind the scenes of a theater. But very much of mechanical skill is required to produce the effects witnessed by the audience at any of our first-class theaters. Having visited one of the popular theaters in this city known for the excellence of its mechanical effects, we will note some of the appliances employed. The stage, with its appurtenances and the rooms connecting, occupies more of the space included within the walls of the theater than the auditorium. Descending two full stories below the stage and ascending two above, the "behind the scenes" is an immense workshop where mechanics in almost every branch ply their several trades. Without attempting to describe the different departments in detail, we will endeavor to give briefly an idea of the strictly mechanical devices by which effects are produced.

The floor of the stage is made in movable cross sections, of southern pine plank, of sections varying from ten inches to three feet in width and ten to fifteen feet in length, traversing inclined slides secured under the floor. These slides incline from the center of the stage toward the ends. these portions of them being depressed enough to allow the thickness of the planks to slide under the floor. The movements are effected by means of ropes secured to the sections and wound upon strong winches beneath the stage. The slides are lubricated with dry, powdered plumbago, without a particle of oil. When the sections are closed the outer ends are elevated to the level of the rest of the floor by cam levers which hold them securely. Through the openings thus made in the stage the scenes which rise to slow music in the piece are elevated. One of these, the grand "transformation scene," weighs not less than six tuns with its load of humanity. To effect this result immensely strong geared windlasses are employed, turned by a number of men who work in perfect accord. Guiding bars of two-inch iron and lifting apparatus in which five-inch ropes are used, afford perfect security.

This machinery is all situated two stories below the stage, a distance of about thirty feet, to give room for the hight of the scenes. Both day and night this subterranean apartment is lighted by numerous gas jets. All the machinery is of the strongest description; in fact strength rather than elegance has been the rule in its construction. The machines for lowering the scenery from above the top of the proscenium are also located here, iron braces, strong ropes, and heavy timber being the agencies for the transmission of the power. Two heavy double force pumps with two-inch hose are also fixed in this sub-basement, intended either to force water in torrents to any part of the building in case of fire, or to supply the water for a cascade in one of the scenes, or to pump it up from the receiving reservoir to the hight necessary to reach the waste sewer.

The cascade mentioned above is as real as any in nature, except that the rocks are made of zinc, soldered water tight and painted. Other minor cascades are merely rotating cylinders covered with gauze, flecked with mica and having a strong light thrown upon them by rows of gas jets. Gas and lime lights perform no insignificant part in the spectacle. In one scene the light changes from a cadaverous green to a ghastly blue, gorgeous red, and brilliant white. This is effected by changing the lenses of the lime lights, situated in the wings at an elevation of twenty feet from the stage, and aided by cylinders covering rows of gas lights made of the different colored gauzes disposed in longitudinal sections.

The work of the "property man" and "carpenter" with his assistants demands also considerable mechanical skill and talent. For instance, the "crystal columns" in a "ball room" scene are semi-cylindrical and about twenty feet high. They are built of timber and mounted on trucks, the capitals being much heavier and larger than the bases, yet the weight is so distributed that there is no top-heaviness nor danger of overturning in moving. The ornamented capitals are of papier maché, molded in plaster of Paris, which molds must be fashioned by hand, or rather the patterns from which they are made. The angles of the uprights of which the shafts of the columns are built, are so arranged as to reflect the gas lights inside the columns to produce a dazzling effect. This requires mechanical skill and a thorough knowledge of optics and of the effects of light on the surfaces of differing angles.

All the work is of the strongest possible character, to insure against accident, and every part of the ponderous machinery is calculated to move with the greatest ease and in perfect concert with every other part.

THE STEAMER "BRISTOL."

With the exception of her consort, the *Providence*, no such magnificent ship has ever been built for sound or river navigation as the *Bristol*, of the Narragansett Company's line between New York and Boston. On the 11th of June she made her trial trip, and in all respects this, her initial effort, was an entire success, but it is a cause for regret that the original significant names of these two vessels, *Puritan* and *Pilgrim*, should have been changed to *Bristol* and *Providence*, names of merely local significance.

The *Bristol* is a ship of about 3,000 tuns measurement, built in all respects like a first-class sea-going ship, and yet combining all the space, elegance, and airiness of the best sound and river boats. Water-tight compartments, immense rigidity and strength of hull, iron braced and securely bolted, strengthened by hog braces, make this ship one of the staunchest that ever floated. The solidity, beauty, and luxury of her internal fittings, upholstery, furniture, and arrangements are beyond dispute unequaled.

But the machinery is eminently superior. Her single beam engine of 110 inches diameter and 12 feet stroke, the largest, with the exception of that of the *Providence*, ever run on a ship, is a model of fine workmanship and easy manipulation. It is furnished with the Sickles' cut-off with the latest improvements. Her wheels, of wrought iron, are 38 feet, 8 inches diameter, the buckets of each wheel being in two sections, the buckets of one alternating with those of the other, and one wheel being placed relatively to the other, so as to obviate the trembling and jar generally so perceptible and often so annoying on steamers. The iron rims of the wheels are knife edged to diminish friction.

The boilers are three in number, and instead of being arranged upon the guards of the vessel, are placed entirely below deck, their weight and that of the water they contain thereby giving stiffness and stability to the vessel in heavy weather. This also admits of the guards forward of the paddle wheels being so narrow as to present little obstruction to the sea. The boilers are 35 feet long and 12 feet, 6 inches diameter, flues below and return tubes above. The furnaces, four to each boiler, are in two tiers, one above the other, the flames and heated combustible gases from the two meeting in one connection common to both, where the hot gases and any uncombined air are so thoroughly mixed as to insure perfect combustion. The total amount of grate surface is 510 square feet, and the fire surface 13,850 square feet. This large grate surface is expected to be adequate to burn the coal by natural draft alone, without the employment of "blowers," which, by producing intense combustion in a small space, are very destructive to the boilers. Another advantage of the natural draft is that it ventilates the stoke hole and causes less suffering to the firemen from heat. The boilers are constructed according to a patent obtained by Erastus W. Smith, A.P.D., the constructing engineer for the line. It is expected that, by the use of natural draft and of the fresh water from the condenser, the duration of these boilers will be nearly double that of boilers using salt water and blowers. The condenser contains 4,000 square feet of tubular condensing surface. The tubes are of brass, without seam, drawn from solid ingots, by the American Tube Works, of Boston. They are tinned inside and outside to prevent galvanic action; and, as they are packed with wood ferrules, according to Horatio Allen's patent, all the difficulties of surface condensation, so long troublesome, are overcome.

The steam chimneys are located on the two outside boilers and pass up through all the decks. They are inclosed in a boiler-iron case, firmly riveted and bolted together. Between this case and the steam chimney is an air space of 18 inches the entire hight and circumference, admitting of good ventilation. The case also supplies complete protection to the passengers in case of leaks to the flues or tubes.

The provisions against danger by leakage and fire are admirable. If need be, in case of leakage, the whole capacity of the circulating pump to the condenser can be applied to the bilge, which would discharge two hogsheads at each revolution of the engine. Three other effective pumps also connect with the bilge of the vessel. To provide for the extinguishing of fire there is an independent steam fire pump set apart in a room with a separate boiler, for use when the large boilers are not at work. From this fire pump or engine, branches off a large copper pipe with branches fore and aft the vessel, and up through all the state-room saloons on to the hurricane deck, connecting with numerous smaller branches fitted with freely-opening water gates and coils of hose all ready attached for immediate use. In addition there is an arrangement for extinguishing fire in the hold by steam admitted through pipes, the key of which is intrusted to the engineer only.

The hull was built by Wm. H. Webb, Esq., under the supervision of Capt. Jed. Williams, and the boilers and engine by Messrs. John Roach & Son, of the Ætna Iron Works, this city. In every respect the description of the *Bristol* applies to the *Providence*. Both are marvels of capacity, strength, power, and elegance. They run between New York and Bristol, R. I., where they make connection by rail—a ride of an hour and a half—to Boston.

On the first trip of the *Bristol* to Bristol, R. I., fourteen miles above Newport, in Narragansett Bay, her time was nine hours, fourteen minutes from the Battery, a distance of 160 nautical miles. time never but once surpassed on a similar course. Her subsequent trips have exceeded this time. Mr. Harrison O. Briggs, of Boston, Mass., is the general manager for the company.

ELECTRICAL ANTI-INCRUSTATORS.

We observe that the *Railway Times* gives prominence in two successive numbers to remarks before the Polytechnic Institute on a new remedy for boiler incrustation, as reported in this paper. We do not object to seeing our report credited to another journal, if it is to be construed as countenancing the slender theory there explained as the basis of another patent electrical anti-incrustator. As a company is said to be forming to manufacture apparatus under the patent, and quite possibly may get as much commercial success at the expense of boiler owners as the not much more meritorious contrivances already in the field have met with, a word on the fallacy involved may be opportune for some of our readers.

The inventor bases his expedient on the existence of a positive electrical state in the suspended salts carried up into the steam space. It need not be denied that the low conductivity of steam favors a sustained slight disturbance of electrical equilibrium during its rapid disengagement. But it is needless, too, to point out that uninsulated bodies in connection, like the boiler and its contents, whatever they may be, cannot sustain an active electrical state of any practical consequence. The most they could do in the circumstances would be to supply an indication through a delicate galvanometer. The proposal, therefore, to collect this trivial amount of electric force upon metallic points and convey it to the boiler iron so as to obtain a discharge between the iron and the salts which was not attained before by the free contact of the two, is refinedly visionary. The Doctor should never say a word against homœopathy. As for deposits enveloped within so good a conductor as water, the notion of employing their electrical activity has not even a theoretical basis.

THE ALBANY RAILROAD BRIDGE.

Our engraving represents this structure as it appeared in March, 1866, which was shortly after its completion. Some years have elapsed since the first inauguration of the enterprise, which delay was occasioned by litigation on the part of Troy and other interests upon the river above Albany, but finally all obstacles were overcome, and the work on this bridge was commenced in April, 1864. The first locomotive the *Augustus Schell*, of the Hudson River Railroad, crossed the bridge Feb. 15, 1866, and the first passenger train on Feb. 22.

The bridge proper (omitting the approaches, which in themselves are quite formidable) consists of two abutments and nineteen piers, making a total length of 2,020 feet. The extreme length of the bridge is nearly a mile. The main channel of the river is crossed by four spans of 178 feet between the centers of the piers, on the plan known as "Howe's" and and two draw spaces of 131½ feet each. The remaining 14 spans over the shallow water on the east side, as also over the basin on the Albany side, are short spans ranging from 75 to 78 feet each, built on the same general plan. The trestle-work approach to the bridge in the city is about 1,500 feet long.

Our view represents the bridge from the Albany Basin to the eastern shore, at seen from the large New York Central Railroad Elevator, which stands a few rods south of the bridge.

The drawbridge, including the iron turn-table upon which it rests, is entirely novel, planned specially for the locality, and the circumstances under which it has been built and will be operated. The piers and abutments are all founded on piles. In some cases the bed of the river was excavated to a depth of ten or twelve feet, and within this space piles were driven to the hard bottom, sometimes as low as thirty-three feet. A heavy timber crib was then built around these piles of the dimensions of the proposed pier, resting on the bottom of the excavation, and reaching to within three feet below water mark. This crib was then filled with concrete and floored with heavy timber, upon which the first stones of the masonry were laid. In other cases, after excavating as before, and driving the piles, the latter were sawed off, and a floating caisson, with a heavy timber floor, of the dimensions of the proposed pier, was anchored over the piles, and the masonry commenced in this caisson, which soon settled to its bearing on the heads of the piles, when the sides were removed by unscrewing some bolts, and floated away to serve elsewhere.

The piers are of cut limestone masonry, with rough faces,

and are thirty feet in hight above low water, and have a width at the bottom of nine feet, and at the top under the coping (which projects nine inches on all sides) of six and one half feet. They are all built of heavy cut stone laid in cement.

The face stones are all clamped together by iron clamps, and, in addition, the two faces of the pier are tied together by iron bars at intervals on each course along the front, extending through the pier from side to side; and still further to insure the strength of the masonry, the head stones are all dowled together with iron dowels—each stone to the stones both above and below.

The bridge has been constructed by "The Albany Bridge Company," constituted mainly of directors in the different railroads centering at Albany, and it is understood that it is owned one-half by the New York Central Railroad, and one quarter each by the Hudson River and Albany and Boston Roads. The total cost of the bridge has been over a million of dollars.

HOW THE PACIFIC RAILWAY IS BUILT.

From an able correspondent of the Cincinnati *Gazette*, who accompanied the senatorial party, we learn the *modus operandi* of the construction of the great trans-continental road, which is steadily progressing at the rate of two miles per day.

"There is really little known by the people of the character of the enterprise. Most think that a company of capitalists are hastily putting down a rude track, over which cars can be moved with care, for the purpose of securing lands and money from the government. The fact is, that one of the most complete roads of which the country can boast, with equipments that surpass many, is being laid with a speed that fails to impress the nation, simply because it is not believed. But let the facts tell their plain yet wonderful story.

"General J. S. and D. C. Casement, of Ohio, grade the road, lay the track, and put up the telegraph. The graders go first. There are two thousand of them. Their advance is near the Beach Hills. They protect themselves and are digging the great fortification which makes the future sure for us, on through Indian battle fields while the daily fight goes on. Their work is done to Julesburg.

"Of tie-getters and wood choppers there are one thousand five hundred. Their axes are resounding in the Black Hills, over Laramie Plains, and in the passes of the Rocky Mountains. They have one hundred thousand ties in these hills awaiting safeguards for trains to haul them.

"A mile in advance of the track layers are the squads which place the tiers. There are three of these. First, however, the engineers set their leveling stakes at distances of one hundred feet on the straight lines and fifty feet on curves. At each of these points sawed ties are placed and leveled by them. Then come two men with a measuring rod, marking off spaces equal to the length of a rail, and also the half of this space. These sawed ties are laid by the second squad, to give firm support to the ends and middle of each rail. These are placed by sighting along the guide ties already laid. The third squad then place the intermediate ties, and the bed is then ready for the iron.

"Now go back twenty miles on the road and look at the immense construction trains loaded with ties, and rails, and all things needed for the work. It is like the grand reserve of an army. Six miles back are other trains of like character. These are the second line. Next, near the terminus, and following it hour by hour, are the boarding cars and a construction train, which answer to the actual battle line. The one is the camp; the other is the ammunition used in the fight.

"The boarding cars are each eighty feet long. Some are fitted with berths; two are dining halls; one is a kitchen, storeroom and office. Under the whole those men who prefer fresh air have swung hammocks. Rifles are hung overhead, plentiful in number, loaded, and convenient. The party protects itself without attention from the government. The track-laying gang numbers 400. On the 350 miles already built there are 1,000 track repairers constantly improving the road bed.

"The boarding cars go in advance. They are pushed to the extremity of the track; a construction train then runs up, unloads its material and starts back to bring another from the second line. The boarding train is then run back till it has cleared the unloaded material.

"Three trucks, each drawn by two horses, ply between the track layers and their supplies. The horses run outside the track, pulling with a long tow line, as boats are moved on canals. They must be out of the way of the workmen. One of these trucks takes on a load of rails, about forty, with the proper proportion of spikes and chairs, making a load, when the horses are started off on a full gallop for the track layers. On each side of these trucks are rollers to facilitate running off the iron. On reaching the end of the last rail the truck is stopped. A single horse is attached to move it over each successive rail. Meantime, the truck last emptied has been turned on its side to allow the loaded one to go to the front. The two horses released are started back on a keen gallop for another supply. The third one moves up in like manner, and thus through all the day they are rushing forward with their iron load. To see them, and reflect what their rush and roaring means, is as exciting as it ever was to watch a battery thunder into position at a needed moment, at the vital point in its line.

"The rails within reach, parties of five men stand on either side. One in the rear throws a rail upon the rollers, three in advance seize it, and run out with it to the proper distance. The chairs have, meantime, been set under the last rails placed. The two men in the rear with a single swing, force the end of the rail into the chair, and the chief of the squad calls out 'down,' in a tone that equals the 'forward' to an army. Every thirty seconds there came that brave 'down,' 'down,' on either side of the track. They were the pendulum beats of a mighty era; they marked the time of the march and its regulation step.

"One of the rear men drove the cars, in addition to handing the rail. The horses started as each rail fell into his place, the truck rolled on to the end of it; a second rail was projected into the wilderness, with the same precision and haste; then came the magic 'down,' the car moved on again, and another length was accomplished.

"Two spikers followed each rail, one party a little in advance of the other. One rail was fastened at the end and at the middle. The second party then drew the opposite rail to the exact gage, and fastened it at the middle and the end. Then came other squads of spikers, moving along with the precision of military drill, each having a particular spike to drive, and no one interfering with another. Track liners followed these, and with their crowbars rectified the line. The fillers came last. One party of these filled and packed the spaces at the ends and middle of the rails; the other completed the intermediate intervals, and the job was left till the squads of track repairers should come up and finish the ballasting. But as the fillers leave it, full trains can run over it with safety at twenty miles an hour.

"These are the dry details. Let the reader picture the scene. The rush of the loaded truck; the successive dropping of the rails in place; the rattle of the spiker's hammer, sounding like a hotly contested skirmish; the roar of the distant supply trains moving up; the resounding of the frequent signals, near at hand; the universal bustle; the 'rumble, and grumble, and roar' of the wonderful advance. Let the elements of savage warfare and the actual presence of hostile Sioux along the bluffs be woven into the picture, and together it forms one that the world has not seen before, and which the stories of magic can scarcely equal.

"Nor is any of this energy wasted. If it is asked: 'How does the work get on?' again let the facts answer. On the 9th of May, 1866, but forty miles of road were completed. In a hundred and eighty-two working days thereafter two hundred and forty-five additional miles were laid and put in prime condition, every rail, and tie, and spike having been brought up from the rear. Seven saw mills furnish the ties and lumber. All bridges are framed, the pieces numbered, and set up where wanted without the least delay. The bridge at Loup Fork is fifteen hundred feet long, and as fine a Howe truss as can be found in the land. While our train was running the sixty miles from North Platte, over a mile of track had been put down and one train passed over it. From one o'clock till four in the afternoon a mile and two hundred feet were added to this while the party were looking on. The progress was astonishing, and the more so because the ground was wet and the soil stiff and hard with alkali.

"Unless driven off by Indians, which does not now seem probable, the road will touch the base of the Rocky Mountains the coming autumn. The California end has already reached a point about a hundred miles east, and is descending the eastern slope of the Sierra Nevadas into the valley of the Humboldt. It is confidently expected that Salt Lake will be reached next year, and that 1870 will see the whole line completed. While the nation has scarcely heard of what was being done, the work has been near one-third accomplished."

A PHILADELPHIA NEWSPAPER ESTABLISHMENT.

The new and splendid building of the *Public Ledger* newspaper, at Philadelphia, was inaugurated on the 20th inst., and the proprietor made it the occasion of a remarkable festive gathering of remarkable people. Many of the prominent newspaper personages from all parts of the country were present and after inspecting the new establishment the company adjourned to the spacious dining rooms of the Continental Hotel, where a magnificent repast was provided, and many fine speeches were made.

The new *Ledger* building is one of the largest printing houses in the Union, very beautiful in architecture, located on the corner of Sixth and Chestnut streets. Every portion of the establishment is complete with regard to light, heating, ventilation, and other comforts. The office and editorial rooms are furnished splendidly. The composing room is on the upper floor, which, by aid of a Mansard roof, has a hight of twenty-one feet. The main entrance is ornamented by a sculptured coat-of-arms of Pennsylvania, and over the doorway at the corner of the streets, is a pedestal sustaining a statue of Franklin, in whose right hand is a lightning rod, which at night will emit gas jets. At the base of the pedestal is a public drinking fountain. The press room has a hight of over twenty-three feet, contains the Harrison boilers, and is to be filled with Hoe's great presses, folding machines, etc. There is not a more complete newspaper establishment in the world.

The *Public Ledger* belongs to the class of cheap or popular daily newspapers. It has been in existence for more than a quarter of a century, and until the breaking out of the war was always sold at one cent per copy. But taxation has deprived the people of the luxury of penny newspapers, and now the *Ledger* readers pay two cents.

The *Ledger* is one of the best daily newspapers in the country, and wields an immense influence for good, in Philadelphia and vicinity. Everybody reads it, trusts it, and follows its counsels. Any thing published in the *Ledger* is regarded by all Philadelphians as authentic. The *Ledger* has a daily circulation of 70,000 copies, an immense weekly edition, and probably more than half a million readers. The *Ledger* was established by Swain, Abell & Simmons. After the death of the last named, a few years ago, Mr. George W. Childs became the proprietor, under whose auspices the establishment continues to prosper. Mr. Childs is a young man of ability and popularity. His success in life has been well earned, and he understands the responsibilities which rest upon him as the owner of a great newspaper.

One of the peculiarities of the *Public Ledger*, is an entire absence from its columns of self laudation, puffery, clap-trap, and braggadocio. Its news and its discussions of public questions, have always been characterized by truthfulness, and an apparent desire to disseminate correct information. If it did not agree with its cotemporaries, it never called them knaves and scoundrels, by way of argument; but stated its views dispassionately, and thus acquired universal esteem and respect.

The editorial management of the *Ledger* has always been remarkably excellent, and we think that to this fact the success of the paper is in a great measure due.

The editor-in-chief is Mr. Wm. V. McKeon, a gentleman of rare qualities for this responsible position. In person he is rather under the medium stature, of compact organization, nervous temperament, large brain, quick perception, fine taste, well balanced mind, safe, cautious, prudent, a ready writer, an accute observer, thoroughly posted upon all subjects, and full of strong, practical common sense. He is indeed a model editor.

Long may the national banners wave from the proud turrets of the *Ledger* building, betokening prosperity to those within her walls and public confidence in their honorable labors.

FRENCH OCEAN STEAMERS.

We learn from the report of the French Trans-atlantic steam navigation company, presented to its shareholders at their annual meeting held in Paris on the 13th ult., some interesting facts in regard to the speed of vessels belonging to this company. Tables drawn up by the post office authorities show that in eleven complete trips from Brest to New York and return, made by the *Ville de Paris* and the *Pereire* between March 1866, and February 1867, in an interval of about twelve months, comprising both the summer and winter seasons, the average speed was 12·8 knots instead of the 11.5 knots required by the terms of the contract. This speed, says the report, we believe has not been equalled even in England; it exceeds by two-tenths of a knot, the average runs of the celebrated *Scotia*, as stated in official documents. One of the quickest passages on record since the commencement of steam navigation between Europe and America, was made by the *Ville de Paris* between the 21st and 30th of July 1866, the average speed of that steamer having been 13.60 knots in a run of 3,000 nautical miles, from port to port. The propeller *St. Laurent*, in one of her passages made 12.10 knots, running 350 nautical miles in twenty-four hours for four consecutive days. The last passage of the *Pereire*, between Havre and this port, was made in nine days and four hours from dock to dock.

In comparing the relative advantages of screw and side wheel steamers, the report asserts the use of the screw procures for vessels of equal tunnage, a saving of about twenty-five per cent in fuel, with an increase of twenty per cent in speed. The results appear to the directors so satisfactory that two steamers the *Washington* and *Lafayette*, of excellent nautical qualities, but too slow for present requirements are to be fitted with double screws, which recent successful trials in England and in the French imperial navy prove, possess theadvantage of being more easily and more economically adapted than the single screw to vessels already built. The saving of fuel and increase of space reserved for passengers and freight, it is claimed will more than balance the cost of transformation.

Internal Revenue Decision.

TREASURY DEPARTMENT,
OFFICE OF INTERNAL REVENUE,
WASHINGTON, June 14, 1867.

SIR: In your letter of the 13th inst. you inquire whether a manufacturer of patented articles is bound to return the full price at which they are sold, including the patent fee, or whether he should be allowed to deduct said fee.

In reply I have to say that whenever a patent enters into the combination of an article or machine, giving additional value to the same, and enhancing its cost or price to the purchaser, such patent becomes an element of value, and cannot be separated any more than any other element of value. The actual sales' price, including royalty, must be returned for taxation. Yours, respectfully,

E. A. ROLLINS, Commissioner.

OBITUARY.

HON. ISAAC NEWTON, Commissioner of Agriculture, died at Washington, June 19th, at the age of sixty-seven, having been born in March, 1800. He was appointed in 1861 Chief Clerk in the Bureau of Agriculture, and in 1862 to the position made vacant by his death. The duties of the office he held were not such as permitted the exhibition of brilliancy of talent, but demanded industry, application, and much patient care, qualities which Mr. Newton undeniably possessed. He was a gentleman highly esteemed by those who knew him for his courtesy, affability, and purity of character.

THE "Modern Carpenter and Builder," noticed in our last issue, is published by Howard Challen, No. 1,308 Chestnut street, Philadelphia.

Photographic.

Mr. Valentine Blanchard has made known a very simple and excellent plan for keeping wet plates in a sensitive condition for a considerable time, after removal from the bath. The plan is to add a few grains of a salt of bromine—cadmium or ammonium—to the collodion. An old collodion works best. We have tried it with success, adding two grains of bromide of ammonium to the ounce of collodion. In some instances our plates remained three hours in the shield before exposure, and developed without surface stains. The rationale of this method is explained as follows by the *Photographic News*:

The value of a bromide in securing immunity from stains, comets, and other markings has long been known; but its mode of operation in doing this has not been well understood. Its action in permitting long keeping, however, is easily explained. The process of double decomposition, in which the bromide salts employed in the collodion are changed into bromide of silver, is much slower, as is well known, than is the conversion of iodides; and when a simply bromized collodion is employed, the immersion in the nitrate bath needs to be very much prolonged, in order to convert the whole of the bromide in the collodion into bromide of silver. In effecting his purpose Mr. Blanchard just pursues the opposite course. Employing a very highly bromized collodion, he gives the plate the shortest possible immersion in the nitrate bath, keeping it in motion from the first, to get rid rapidly of the greasy, streaky appearance of the plate. The solution running evenly over the film, without streaks or oily-looking lines, which is generally regarded as the indication of sufficient immersion, is, in reality, no test of the conversion of the salts in the collodion film into salts of silver; it merely indicates that the alcohol and ether in the film have become thoroughly mixed with the aqueous solution, and that the mutual repulsion has ceased. Under ordinary circumstances, however, by the time this is thoroughly effected, the mutual decomposition of the iodides originally in the collodion and the nitrate of silver, and the formation of iodide of silver and a nitrate of potash, or other base is also complete. With bromides, as we have said, this operation is not so rapidly completed; if therefore, a collodion film containing a large portion of bromide be immersed and kept in motion so as rapidly to get rid of greasiness, and then removed after a very brief immersion, the film will contain a large portion of the bromide—say, of cadmium or ammonium—which remains undecomposed, and is not converted into bromide of silver. In this fact lies the safety of the plate for long exposures. The free nitrate of silver—which would otherwise be crystallizing on the surface of the film, or, by the concentration of the solution caused by evaporation, acquiring a readier tendency to abnormal reduction—now performs a different office: being in contact with the unconverted bromide of cadminm or ammonium, it is decomposed by it, and aids in the formation of bromide of silver in the film. Instead of being made stronger by evaporation of water, the free nitrate is made weaker by the loss of the silver which combines with the bromine, whilst the nitric acid, combining with the base which leaves the bromine, produces an innocuous, or possibly in some cases a hygroscopic, and therefore beneficial salt. It will thus be readily seen how the use of a large portion of bromide and a very short immersion of the plate in the nitrate bath tend to prevent the stains of crystallization or of reduction consequent on long exposure in warm weather. The mode in which the effect in question is secured in the case described may possibly suggest an explanation of the general action of bromides as aids to clean negatives. It is probable in most cases where a freely bromized collodion is employed, and the plate kept in the nitrate bath the usual two or three minutes, that some portion of unconverted bromide remains in the film, and that the formation of bromide or silver goes on after the plate leaves the bath, the bromide of silver being formed at the expense of the free nitrate on the film, which is thus much weakened. As the use of a weak solution of nitrate silver, at times secured by re-dipping the plate in a weak bath, is known to be conductive to cleanliness, the weakening of the free nitrate by the formation of bromide of silver may also be a source of the cleanliness well known as an accompaniment of the use of bromides.

The amount of bromide in collodion for very long exposures may vary from two grains to two and a-half. Any soluble bromide may, we presume, be used without impropriety.

Sheathing Iron Vessels with Wood.

A correspondent gives us an account of a method of repairing an iron steamer running between New York City and South Amboy, which, in fifteen years' service had become very much corroded externally, although her frame was sound. She was taken out of the water and planked with three-inch yellow pine from the keel to the guard braces, the planks being bolted with five-eighth bolts every linear foot, with large square washers on the inside of the hull; an oak keel was also added and the work was done within five weeks. She is 270 feet long and 30 feet beam, and required over 9000 bolts. She is now believed to be good for at least another fifteen years' work. Parties specially interested in the object are advised to investigate the matter. It is very important if as feasible as our correspondent believes it to be.

CIGARS AT THE SEA SHORE.—Every cigar maker knows the difficulty of keeping cigars dry on shipboard and of preserving the aroma of an ever-so-fine Havanna, on the sea coast. Travelers and sojourners at the sea shore who have been at their wit's end to devise a means to protect their cigars from the influence of salt air, will find a simple remedy in the use of a common glass fruit jar fitted with an air-tight metallic or glass stopper

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 18, 1867.

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.

65,785.—GLUE.—William Adamson, Philadelphia, Pa.

I claim a glue consisting of size aerated, or treated with gas, substantially in the manner described.

65,786.—PROCESS OF MANUFACTURING AERATED GLUE.—William Adamson, Philadelphia, Pa.

I claim the mode or process substantially as herein described of aerating carbonating size for converting the same into glue.

65,787.—MANUFACTURE OF GLUE.—William Adamson, Philadelphia, Pa.

I claim the combination substantially as described of glue or size with carbonate of soda for the purpose specified.

65,788.—CAR TRUCK.—C. F. Allen, Aurora, Ill.

1st, I claim an eight wheel truck which is composed of two independent four wheel trucks connected together by means of a platform, A, which is supported upon, and connected by pivots to laterally swinging spring beams, arranged substantially as described.

2d, In an eight wheel truck, I claim the combination of the laterally swinging and vertically elastic beams, D D and K, with the side springs, f f, and equalizing beams, D' D', so arranged that the weight of the load upon the center of the platform, A' will be uniformly disposed upon all the axles of the trucks, substantially as described.

3d, The connecting platform, A, constructed of wood and metal provided with a swinging beam, K, and strengthened by means of trusses or braces, J J, substantially as described.

4th, In combination with the bars, b, b', braces, c c, pedestals, a a, steps, c' c', and saddles, c2 c2, I claim the transverse beams, C C, metal boxes, e e, pillow blocks, d d, fulcra straps, g', and the equalizing beams, D D, with their springs and connecting loops all arranged and operating substantially as and for the purposes described.

65,789.—FLOUR BOLT.—Elkanah Bateman, Frederick City, Md.

I claim the buckets, n, arranged and operating in combination with the bolting cylinder and fan, substantially as herein set forth.

65,790.—CAR SPRING.—Julien F. Belleville, Paris, France.

I claim the spring composed of trunco-conical disks having the form and proportions herein specified, arranged in pairs, united by means of a rod passing through the center of the said disks as shown and set forth.

65,791.—FAUCET.—Marshall Burneet, Boston, Mass.

I claim a faucet having the cylinder, C, valve, F, cone, H, and cam lever, I J, all constructed and arranged substantially as shown and described.

65,792.—FLOAT OR RAFT.—Andrew Carson, Memphis, Tenn.

1st, I claim constructing a float for saw mills or the purposes herein described, by securing a sufficient quantity of light timber or other material together in a solid mass, and supporting a platform on the same, substantially as herein described, for the purpose set forth.

2d, I claim attaching side floats to the main float, for steadying the structure, and making room to deposit the sawed lumber, as herein described.

65,793.—GRAIN DRYER.—Lewis S. Chichester (assignor to himself C. W. Mills and G. H. Nichols), Brooklyn, N. Y.

1st, In a grain drying apparatus, I claim a chamber above the fire into which air is admitted in large volumes and descends and mingles with the products of combustion and passes into the grain dryer, substantially as and for the purpose specified.

2d, I claim the arrangement of the hot and cold air flues, f and n, trunks, g or g' and valves, l l,' and m m', for regulating the temperature of the air passing into the grain drying chamber, k, substantially as specified.

3d, I claim a series of half pipes crossing the grain chamber and opening at or near both ends into air spaces or flues as set forth, so that the current of air shall pass through and beneath the half tubes and in contact with the grain as set forth.

65,794.—MACHINE FOR FILLING CYLINDRICAL MOLDS FOR RUBBER GOODS.—J. W. Cobb, Melrose, Mass.

I claim so connecting by gear or otherwise the pattern roll, M, with the filling roll, R, that the said filling roll, R, shall always revolve with greater rapidity than the pattern roll, M, made substantially as described and for the purpose set forth.

65,795.—SLATE FRAME.—J. M. & John Connel, Jr., Newark, O.

I claim a corner casing of elastic or resilient material constructed substantially as described to hook into notches in the edges of the slate.

65,796.—WOOD PLANING MACHINE.—W. H. Doane and W. E. London, Cincinnati, Ohio. Antedated Dec. 18, 1866.

1st, We claim the combination of two or more removable tonguing and growing cutter heads, having attaching stems, formed on or applied to them, two or more spindles with their upper ends below the surface of the planing bed, and a rotary planer, constructed and arranged so as to operate substantially as and for the purpose set forth.

2d, Placing the beading shaft of a planing and matching machine within or upon the pressure bar for the several purposes and in the manner described.

65,797.—AXLE BOX.—D. H. Dotterer (assignor to himself and Dillwyn Parrish, Jr. Philadelphia, Pa.

1st, I claim the hollow roller, B, having openings arranged substantially as described, for permitting the lubricating material to pass through the said roller to the stationary pin, E.

2d, The said stationary pin, E, and its longitudinal groove, q, in combination with the hollow roller and its openings.

3d, The stationary pin, E, arranged within the box and confined thereto by the detachable cap or follower, k, and substantially as described.

65,798.—GANG PLOW.—C. L. Eastham, Rhodes Point, Ill.

1st, I claim the combination of the axle, A, and hinged bar, C, provided with the lever, l, and having the plows attached thereto as described, all constructed and arranged to operate substantially as set forth.

Second, The combination of the lever, L, connected to the plow beams and having a fulcrum at or near the axle, with the elbow lever, E, pivoted to the tongue or equivalent part arranged to operate as described.

65,799.—CAR REPLACER.—N. H. Edgerton, Pottsville, Pa.

1st, I claim the reversible and detachable canting block, K, secured to the rail, A', and the depressed foot, n, substantially as described.

2d, I claim the plated incline, D, having a projecting foot, m, in combination with a canting block, K, adjusted substantially as described.

3d, I claim the combination and arrangement of my second claim with the inclined block, C, when both are constructed and operating substantially as described.

65,800.—SPECTACLE.—George D. Edmondson (assignor to himself and Albert R. Clark), Detroit, Mich.

I claim the spectacles with lenses each of which consists of two pieces of different relative convexity and set at a different angle in the bezel, substantially as described.

65,801.—ROCK EXCAVATOR.—W. H. Elliot, New York City.

1st, I claim the combination of car, a, track, h', and drilling machine, e, when said machine is suspended from a car, substantially as herein shown and described.

2d, Platform, c, in combination with car, a, and drilling machine, e, substantially as and for the purpose herein set forth.

3d, Adjustable support, f and f', in combination with car, a, and drilling machine, e, substantially as and for the purpose herein shown.

4th, Frame, m'', in combination with drilling machine, e, and platform, c, for the purposes herein set forth.

5th, Braces, o, in combination with platform, c, substantially as and for the purpose herein set forth.

65,802.—DRILLING MACHINE.—W. H. Elliot, N. Y. City.

1st, I claim the carriage, k, with springs, n or n', in combination with cranks, h', and drill spindle, l, when operating substantially as herein shown and described.

2d, Projections, n', and a corresponding collar on the drill spindle, in combination with spring, n, when employed substantially as and for the purpose herein specified.

3d, The combination of crank, h', drill spindle, l, and spring, n, when employed as devices for producing excess of motion in the drill spindle over that given to the connecting rods by the cranks which shall cause the machine to feed towards the rock, substantially as shown.

4th, The pawl, u, and rack, u', when acted upon by devices producing excess of motion in the drill spindle over that of the connecting rods for the purpose of feeding the machine towards the rock, substantially as herein set forth.

5th, Plate, m', with its diagonal edge when acting on the notches on the collar, m, to revolve the drill when operated upon by devices producing excess of motion in the drill spindle over that of the connecting rods, substantially as shown and described.

65,803.—PACKING PUMP JOINTS.—Benaiah Fitts, Newark, N. J.

1st, I claim the packing composed of india-rubber, or other similar substances, formed or constructed substantially as set forth and described, that is to say, a packing made by applying the prepared india-rubber in the plastic state to the different surfaces as shown, and compressing it to fit all the inequalities, recesses or grooves in the metal, and being made in vulcanizing to adhere firmly to one part of the metal leaving the other to be freely removed.

2d, I claim a pump valve composed of a metallic case in which is confined india-rubber adhering to the metal by being vulcanized therein and forming an elastic face, as described.

65,804.—FRUIT PARER.—D. H. Goodell, Antrim, N. H.

I claim the combination of the arm, V, with the notched slot, S, in the plate, for the purpose described.

I also claim the described fruit parer, when all its parts are arranged and operated as set forth.

65,805.—CIGAR-MAKING MACHINE.—John Hafer and J. A. Henderson, Bedford, Pa.

1st, We claim the packing tube, C, arranged and operating as described.

2d, The combination as described of a fixed hopper tube or feed pipe with a reciprocating tube, for the purpose set forth.

3d, The combination substantially as described of a fixed hopper tube or feed pipe with a plunger reciprocating inside and a packing tube reciprocating outside the feed pipe for the purpose of filling a wrapper with fine-cut tobacco.

65,806.—SORGHUM STRIPPER.—David Hain, H. A. Gross and Martin Hain, Gasconade county, Mo.

1st, We claim two pairs of semi-elliptical knives, c2 c3, one pair of which is to be placed in front of the other, substantially as described and set forth.

2d, We claim the flexible handles, c c', in combination with the knives, c2 c3, for the purpose of allowing the said knives to yield readily to any variation in the size of the stalk passed between them.

3d, We claim the knife handles, C', and the toggle bars, D, when combined as herein described and set forth for the purpose of opening or raising the knives, C3.

4th, We claim the knife handles, C', the toggle bars, D, the spring, D2, or its equivalent, the rod, D', the link, d, and the treadle, D3, when constructed and arranged substantially as herein described and set forth.

65,807.—TYPOGRAPHIC MACHINE.—Tho. Hall, Bergen, N. J.

1st, I claim weights attached to the type levers when they are so arranged that they act with less power when the type is making its impression than at any other position.

2d, The stop mechanism, 1 1 1 1, and hollow shaft, 2, substantially as described.

3d, The arrangement for moving table, by varying length of levers to suit each type, substantially as described.

4th, The method of spacing between letters and words by a variable length of lever, J, by which the space for each letter is increased or diminished equally, substantially as shown.

5th, Moving paper by the clutch, n, on straight rod, m, substantially as described.

6th, Lever, Q, and connections for moving table, substantially as described.

7th, Parallel motion for moving table backward and forward, substantially as described.

8th, Ring, R, or its equivalent, for stopping type when making an impression.

9th, Automatic stop operating when the printing has reached the end of the line, substantially as described.

10th, Varying the length of movement of the table, P, or substance to be printed upon by causing the keys to move different distances before acting on the feed mechanism.

65,808.—ELECTRIC APPARATUS FOR LIGHTING GAS ENGINES.—Oscar Hammel, Jersey City, N. J.

1st, The arrangement of the battery, B, coil, C, pendulum switch, G, and electric hammer, E, all constructed and operating substantially as and for the purpose set forth.

2d, The pendulum switch, F, in combination with the slide, H, or its equivalent, constructed and operating substantially as and for the purpose described.

3d, The electric hammer, E, in combination with the slide, H, or its equivalent, and with the pendulum switch, G, constructed and operating substantially as and for the purpose set forth.

4th, The saddle, p, on the electric hammer, E, in combination with the serrated bar, q, on the slide, H, or its equivalent, constructed and operating substantially as and for the purpose described.

65,809.—LEMON SQUEEZER.—Oswald Hesselbacker and Henry Moesta, Detroit, Mich.

1st, I claim the construction of the frame of a lemon squeezer of the parts, A and B, and a circular bracket, C, which latter is adapted for receiving and supporting a straining cup, D, beneath a plunger, E, substantially as described.

2d, The combination of the vibrating slotted cam lever, G J, and plunger, E, with the cup, D, and its supporting segment, C, constructed and arranged substantially as and for the purposes described.

65,810.—SEED PLANTER.—C. T. Holman, Conneautville, Pa.

1st, I claim perforating the shank of the furrowing tooth and arranging the seed tube to pass through it, substantially as described.

2d, I claim arranging the hoppers on and hinging the furrowing, seeding and covering fixtures or devices to the blocks, J J, arranged to traverse between ways and adapt the planter to rows of different widths, substantially as described.

3d, And in combination with devices hinged to the blocks, J J, I claim the swinging bar, Q', worked by the cam, Q, and so arranged as to work and operate the several parts in the different portions in which they may be placed to vary the width of the rows planted.

4th, I claim making the swinging bar, M', which connects the shank of the furrowing tooth to the link so long that the tooth and link may be traversed on it, substantially as described, in adjusting the machine to rows of different widths.

65,811.—WATER ELEVATOR.—Thomas Holmes, Bristol, R. I.

I claim the combination of the brake lever, G, and pawl, F, with the gear wheels, D C, when arranged substantially as described and for the purpose set forth.

65,812.—BREECH-LOADING FIRE-ARM.—W. W. Hubbell (assignor to himself and J. H. Orne), Philadelphia, Pa.

1st, I claim the breech, B, with its rear face, c, secured firmly in the concaved front of the ordinary screw base, a, of the barrel by the fixed shaft or center, b, with this breech, B, operating the breech, C', under the side ribs, n', by means of the link, D, and locking by their faces, f and e, and by the projection, d, into the bore of the barrel, all within the recess substantially as described.

2d, The detachable cheek pieces, E E, arranged for the introduction of the breech, C', to and its withdrawal from the recess and the rear of the barrel, substantially as described.

3d, The single retracting bar, G, moving in a groove, 4, in one of the two opposite sides of the recess, both in loading and extracting the cartridge shell by the projection, 5, in the slot, 9, and intercepted at each end of the latter by the breech, C', substantially as described and shown.

4th, The stationary rear striker, 12, and the breech, B, and its striker, 11 operating together as described both with and without the front striker, I, when the ends of the striker and breech pieces are beveled, substantially as specified.

5th, The ribs, n', in combination with the rear space, w, and with the retractor, G, to insure the insertion of the flange of the shell in the rear of the retractor head, 6, as described.

6th, The combination of the breech, B, link, D, breech, C', retractor, G arm, F, with the strikers, constructing and operating together successively in the recess and with the barrel to insert, fire, withdraw, add eject the primed ammunition or shell, as described.

65,813.—COUGH MIXTURE.—P. M. Huffman, Harvard, Ill.

I claim a cough mixture which is composed of the several ingredients mixed together in about the proportions specified.

65,814.—CARPET LINING.—M. A. Johnson, Lowell, Mass.

I claim as a new article of manufacture a felted hair bat, or its equivalent, covered with strips of paper on one or both of its sides, and leaving intervening uncovered spaces between the strips for the dust to pass through.

65,815.—SHOE HOLDER.—L. C. Keeler, Montrose, Pa.

I claim a shoe holder constructed as described consisting of the standards, B B', one or more, provided with hooks, a, stirrup or plate, A, and clasp, D, substantially as herein shown and described.

65,816.—PARLOR TENPIN ALLEY.—E. W. Keyes, Boston, Mass.

I claim a parlor alley made with movable or folding buffers, D D', substantially as described and for the purpose set forth.

65,817.—CONSTRUCTION OF SIGNS.—G. H. Kitchen, New York City.

I claim a prismatic illuminator formed of an opaque case with openings to which prisms are applied, substantially as and for the purposes set forth.

65,818.—APPARATUS FOR WASHING AND SEPARATING COAL.—C. A. Comp, New York City.

1st, I claim the arrangement of the grinding rollers, C, and elevator, D, in combination with the assorting drum, E, constructed and operating substantially as and for the purpose set forth.

2nd, The arrangement of the assorting drum, E, in combination with the separating machines, G, constructed and operating substantially as and for the purpose described.

3d, The arrangement of the drying drum, A, in combination with the separating machines, G, and assorting drum, E, constructed and operating substantially as and for the purpose set forth.

65,819.—FENCE.—I. L. Landis, Lancaster, Pa.

I claim so constructing the panels of a fence that one of the rails of each panel shall overlap the corresponding rail of the adjoining panel and secure ing the same together by a wire fence, in the manner specified.

I also claim specially the mode of fastening shown in Fig. 5.

65,820.—CIRCULAR COKE OVEN.—F. J. F. Laumonier, Augers, France.

1st, I claim a circular coke oven composed of any suitable number of radial compartments converging toward a central chimney, substantially as herein described.

2d, The combination with the radial compartments of a circular coke oven as described of the flues for conducting the products of combustion from the said compartments to the central chimney under the arrangement herein shown and specified.

3d, The combination with the radial compartments provided with openings in their top of the circular railway passing over the said openings, as and for the purposes set forth.

4th, The application and use in connection with the herein-described coke oven of the water conduit or pipe encircling the same, substantially as and for the purposes herein specified.

65,821.—SHAFT COUPLING.—W. E. London and John Richards, Cincinnati, Ohio.

We claim the use of two conical sleeves within two separate conical shells arranged to act independently on each shaft and forming the two halves of a shaft coupling, as herein set forth and described.

65,822.—MELODEON.—La Fayette Louis, Providence, R. I.—Antedated June 11, 1867.

1st, I claim combining with a tremolo valve, h, hinged directly to an immovable or fixed valve seat, an auxiliary valve, g, for regulating the direct passage of the air from the reeds to the bellows, substantially as described.

2d, I also claim in combination with the valve, h, the lever, m, and its counter-balancing weight, q, when this lever is pivoted or hung directly in or to the valve board, substantially as set forth.

3d, Applying such weight to the lever by means of an adjusting screw, substantially as set forth.

4th, Combining with the valve, g, the buttons, r, made adjustable with respect to the valve seat, substantially as described.

5th, Also combining with a tremolo valve, h, and a direct passage valve,

a lever extended down from the valve to such position that it may be operated by the knee or foot of the performer, substantially as set forth.

65,823.—APPARATUS FOR HEATING CHEESE VATS.—Henry W. Millar, Utica, N. Y.

1st, I claim, in combination with one or more cheese vats, a heater constructed of metallic pipes, substantially as herein described and set forth.

2d, Connecting a coil of metallic pipes which forms either wholly or in part the heater of a cheese vat with one or more perforated pipes, G, placed in said cheese vat, substantially as herein described and for the purpose specified.

3d, In combination with a cheese vat and a circulating heater for said vat, the arrangement af the heating pipes, G, and the cool water pipe, E, substantially as herein described and for the purpose specified.

4th, The combination of the pan, H, with a coil heater, D, and one or more cheese vats, when constructed and arranged substantially as herein described and for the purposes specified.

5th, The use of the eccentric legs or levers, in combination with a cheese vat, constructed and operating substantially as herein described and set forth.

65,824.—LIFE BOAT.—M. V. Nobles, Elmira, N. Y.

1st, I claim covering the hold of a life boat with a flexible air and watertight covering supported by and fastened to a sustaining frame, substantially as described.

2d, I also claim making the cover of a life boat of double rubber or other cloth with air space between, so that it may be inflated and thus made more buoyant, substantially as described.

3d, I also claim ventilating the hold of a life boat through a hollow mast furnished with separated passages whether by natural or artificial currents of out-going impure and incoming fresh or pure air, substantirlly as described.

65,825.—BOAT-DETACHING TACKLE.—M. V. Nobles, Elmira, N. Y.

I claim, in combination with hinged and dropping holding heads, the lifting and lowering rods, l, and the locking and unlocking arms, b, all operated by one lever or one shaft so that the whole may be within the control of one person, substantially as and for the purpose described.

65,826.—METHOD OF UNLOADING GRAIN.—Isaac H. Palmer, Lodi, Wis.

1st, I claim valves in the floors of cars, carriages, etc., for drawing off grain or other materials without handling the same, substantially as described.

2d, The slide valves, b, in combination with the racks, c, pinions, l, and shaft, D, substantially as described.

3d, The pivoted valve, c, in combination with crank, l, substantially as described.

65,827.—GLOVE FOR HUSKING CORN.—Albert W. Preston, Mazon, Ill.

I claim a husking glove made to cover the back of the hand, thumb, and fingers, and the fronts of the ends or first joints of the thumb and fingers with a strap around the thumb and wrist, substantially as shown and described.

I claim a husking glove with the front of the fingers and thumb covered or shod with sheet metal, substantially as described.

And in combination with the plate on the thumb, I claim the spur or projection, G, on said plate.

And in combination with the plate on the forefinger, I claim the spur or projection, K, on said plate for opening the husks on the ears of corn.

And in combination with the plate on the forefinger and the spur for opening the husks, I claim the projection or arm, J, to rest on the back of the middle finger to prevent the plate from turning on the forefinger.

I claim making the backs of the fingers to lace up, substantially as described, so as to adapt the glove to fingers of different sizes.

65,828.—MILK CAN.—William Ralph, Utica, N. Y.

1st, I claim the socket, a, when applied substantially as described for the purpose mentioned.

2d, The combination of the plate, B, socket, a, and handle, C, for the purpose set forth.

65,829.—STAY OR BRACE FOR BOOTS OR SHOES.—Timothy K. Reed, East Bridgewater, Mass., assignor to himself and Elmer Townsend, Boston, Mass.

I claim the application and arrangement of a metallic brace stay or cap with respect to the junction of the sides of the slit in the upper of a balmoral boot or shoe, as herein described.

Also, as an improved manufacture, a balmoral boot or shoe as provided with a stay brace or cap arranged with respect to the junction of the sides of the slit of its upper, as hereinbefore explained.

65,830.—PROCESS OF REFINING IRON, STEEL, AND OTHER METALS.—Jacob Reese, Pittsburgh, Pa.

1st, I claim refining iron, steel, and other metals, by means of a blast of atmospheric air, or other de-carbonizing blast in a refinery or furnace heated with coke or other carbonaceous fuel, when a layer of metallic oxide is interposed between the fuel and the metal under treatment, for the purposes hereinbefore set forth.

2d, The use of a covering of metallic oxide for protecting metals from the influence of carbon, substantially as hereinbefore described.

3d, The use of hydro-carbon liquid, vapor, or gas, in the procecs of refining iron or steel, in the manner substantially as hereinbefore described.

4th, The use of a hydro-carbon liquid, vapor, or gas, for the purpose of removing sulphur and phosphorus, or either of them, from iron, steel, or other metals, in the process of refining, substantially as hereinbefore described.

65,831.—MACHINE FOR MAKING FISH BARS FOR RAILROAD RAILS.—Jacob Reese, Pittsburgh, Pa.

I claim the combination of the moving die, o, and stationary grooved die, o', with the punches, s' s', operating and arranged substantially as described for the purpose of pressing, punching, and bending fish bars at one operation.

65,832.—MACHINE FOR STRAIGHTENING CYLINDRICAL BARS OF METAL.—Jacob Reese, Pittsburgh, Pa.

1st, I claim rolling and straightening cylindrical rods, bars, shafts, and tubes or pipes of iron, steel, or other metals, between the conical faces of revolving disks or the conical ends of revolving rolls, arranged substantially in the manner and for the purposes above set forth.

2d, The pair of revolving cone-faced disks, arranged as described, so as to revolve in opposite directions, having their axes of revolution inclined so as to bring their operative faces, forming the bite of the disks, parallel to each other, and having their axes in slightly different planes for the purpose of giving a combined rotary and forward motion to the metallic rod bar shaft or tube held between the bite of the disks, substantially as hereinbefore described.

3d, The combination of a pair of rolls or disks, d d' having conical ends or faces, with the rest roller, n, arranged and operating substantially as hereinbefore described.

4th, The combination of the screw, p, with the axle, o', and disk or roll, d', for the purpose of increasing or lessening the distance of the disk or roll, d', from its corresponding disk or roll, b, substantially as above described.

65,833.—PAPER BRIM.—C.E.Richards, North Attleboro, Mass.

I claim a braid or band composed of a series of paper threads or strands united together, and to be used as and for the purposes set forth.

65,834.—SULKY PLOW.—John C. Rogers, Alden, N. Y.

1st, I claim connecting a sulky to a plow by means of the link or universal joint D1, or equivalent, for the purpose and substantially as herein described.

2d, The combination and arrangement, with a plow of common construction, of the rack, D, link, D1, pinion, E, crank shaft, E1 F, weighted pawl, G, and ratchet wheel, G1, all arranged upon a sulky, in the manner and for the purpose substantially as described.

3d The projection, d2, or equivalent, formed upon or connected to the lower end of the rack, D, in rear of the link or universal joint, D1, for the purpose and substantially as described.

4th, The spring rods, I I, when constructed and used for the purpose, substantially as herein set forth.

5th, The jaws, J, in combination with the pole of a sulky plow, for the purpose and substantially as described.

65,835.—WINDOW-SASH SUPPORTER.—Blaney E. Sampson, Boston, Mass., assignor to himself and J. B. Proctor, Fitchburg, Mass.

I claim the combination as well as the arrangement of the inclined plane, b, the roller, c, the carrier rod, d, its arm, f, or arms, f f', the spring, e, and the spring latch, l, arranged in the window frame, the whole being substantially as described.

65,836.—MODE OF BOXING OIL CANS.—David Saunderson, (assignor to John Ringer), St. Louis, Mo.

I claim the combination of the wooden box, B, can, F, and wedge, A, as above named and described and for the purposes set forth.

65,837.—SAD IRON.—William Siefert, New York City.

I claim a sad iron having stem, C, with spiral spring, s, and projection, a, thereon, in combination with the slot, v v', with the upward projection thereon, as described, when constructed, arranged, and operating as herein specified.

65,838.—COMPOSITION FOR MATCHES.—E. K. Smith, Philadelphia, Pa.

I claim a composition, consisting of the materials described, for the purpose specified.

65,839.—NUMBERING MACHINE.—Sam. Soule, Milwaukee, Wis.

1st, I claim the stamp frame with its shaft and plate, J, cylinder, a, ratchet, S, type wheels, v v v, frames, B C, dog, d, and dogs, e f, all constructed and arranged substantially as and for the purposes set forth.

2d, The arrangement of the arm, E, plate, F, roller frame, H, with rollers, K K, and spring, c, in combination with the revolving table, M, and screw, P, when used in the manner and for the purposes set forth.

3d, The guide frame, X, and rubber, Z, for regulating the printing of the type by means of its slide, x2, in the manner and for the purposes specified.

65,840.—MEDICAL COMPOUND.—Jas. H. Sperling, Peru, Ill.

I claim the combination of the said ingredients in the proportions designated substantially, and applied in the manner set forth.

65,841.—DITCHING MACHINE.—Nathan Starbuck, Wilmington, Ohio.

I claim the combination of the vertically adjustable yoke, F, cutting wheel, G, lever, H, scraper, I, suspended in the rear of said wheel, G, to the hinged pendant, g, and fender, K, arranged and operating as and for the purpose herein set forth.

65,842.—METHOD OF BOTTLING MINERAL WATERS.—Charles H. Thomas, Philadelphia, Pa.

1st, I claim bottling or drawing water from mineral wells or springs under pressure, substantially as described.

2d, I claim taking the water from a point in the well or spring below the point of discharge, substantially as described.

3d, I claim the use, in a universal well or spring, of the perforated diaphragm, a, as herein set forth.

4th, I claim the charging of mineral waters with an extra supply of gas, either in the well or in the tank, substantially as herein described.

65,843.—AWL.—S. E. Totten (assignor to himself and Cyrus L. Topliff), Brooklyn, N. Y.

I claim an awl, having a longitudinal groove, D, as herein set forth for the purpose specified.

65,844.—PRESERVING FRUIT.—W. H Trissler, Cleveland, O.

I claim the pipe, D, and plate, B, as arranged in combination with the can, A, when used for the purpose and in the manner described.

65,845.—MODE OF DRESSING SIDE STRAPS FOR HARNESS.—James F. Valentine, Union County, Ohio.

I claim the combination and arrangement of the knives or bits, f f, with the box or trough, together with the levers, b b, the pin or bolt, c, and the widening or regulating screws, d d, substantially as set forth and for the purpose therein named.

65,846.—APPARATUS FOR BURNING PETROLEUM AND OTHER HYDRO-CARBONS.—Henry C. Van Tine, Pittsburgh, Pa.

I claim the use of a fire pan filled or partially filled with gravel or small stones and supplied with petroleum or other hydro-carbon fluid by a pipe or pipes, in combination with a perforated pipe or pipes for admitting jets of steam into the fire space above the surface of the gravel, substantially as and for the purposes hereinbefore described,

65,847.—COMBINED COTTON PLOW AND SCRAPER.—Thos. P. Warren (assignor to Warren & Woodhouse), Norfolk, Va.

1st, I claim the standard, B, having the broad flange, X, the slots, b b, and the arm, z, substantially as and for the purpose described.

2d, The combination of the standard, B, and the flanged supporting attachment, C, substantially as and for the purpose specified.

3d, The scraper guide, K, attached to the landside in the manner and for the purpose above shown.

65,848.—MANUFACTURE OF SORGHUM SUGAR.—Rufus Watson and Thomas Spencer, Central College, Ohio.

1st, We claim the herein described process of granulating sirup; the said process consisting in having the sirup flow over a shelf or shelves, or their equivalent, of suitable length and inclination, so as to effect granulation, substantially as described.

2d, We claim the apparatus constructed substantially as herein described, for the purpose set forth.

65,849.—TEA CANISTER.—Wm. Welbourne, Preston, Great Britain.

I claim a canister having partitions and doors arranged and operating substantially in the manner and for the purpose described.

65,850.—POT FOR LEAD BATH FOR TEMPERING STEEL, ETC.—Charles V. Wilson, Newark, N. J.

I claim the pot or bath made of wrought and cast iron combined substantially in the manner and for the purpose hereinabove specified.

65,851.—LAMP BURNER.—Moses B. Wright, Meriden, Conn.

I claim a lamp burner provided with two wick tubes, b c, one of which, c, is placed above and not surrounding the other, b, and which communicates with a closed chamber below, substantially in the manner and for the purpose set forth.

65,852.—MODE FOR FURLING AND REEFING SAILS.—William Wyatt, New Bedford, Mass.

I claim the combination and arrangement of the furling and reefing topgallant sails and royals by means of head lines and luff lines running through blocks on the upper and under sides and ends of the yard, and travelers affixed to the sail and running in grooved ways formed by securing metallic plates to the yard, as herein described, operated by raising and lowering the yard as set forth, for the purpose specified,

65,853.—MACHINE FOR MAKING MATCH SPLINTS.—Chas. L. Zeidler, Cincinnati, Ohio.

I claim the knife constructed in one piece, with punches, K K, and rearward prolongations, J J', all as herein described and for the purposes specified.

65,854.—HOOP SKIRT.—Ephraim Adams, Jr., Attleboro, Mass.

I claim the combination of the bustle springs, c, and the central tape, d, substantially as described for the purpose specified.

65,855.—METALLIC PAINT KEG.—James C. Adams, Philadelphia, Pa.

I claim a metallic paint keg having its top formed by turning over the edge thereof flat, twice, substantially as shown and described.

65,856.—MACHINE FOR FASTENING BALE TIES.—Joseph Adams, New Orleans, La.

1st, I claim the mortise, C, in the bed of the machine, to admit the tie buckle or fastening and to accomplish its adjustment to the hoop by the same motion which bends the hoop.

2d, The spring, G, as set forth above.

3d, The indentation or oval shape in the handle, at the point, I, and at the points, H H, to form the bend over and under the spring, G, substantially as described and represented.

65,857.—STOPPER FOR BOTTLES, JUGS, ETC.—J. B. Alexander, Washington, D. C.

I claim the bore, I, figs. 1 and 2, the plug, E, fig. 1, the ping, F, fig. 2, the screw, H, and auxiliary piece, G, fig 3, in combination with the rod, C, and the plates, B and D, and the body, A, substantially as described and for the purpose set forth.

65,858.—WASHING MACHINE.—George Arnold and Jacob Greve, Cleveland, Ohio.

1st, We claim the rubbing board, C, so arranged in combination with the board, D, provided with angular notches, a', arms, L, and springs, O, for the purpose and in the manner set forth.

2d, The rubbing-board, C, rollers, L L', as arranged in combination with the roller, J, springs, E, and box, A, as and for the purpose described.

65,859.—LAPPING-BRAID.—William Rhodes, Providence, R. I.

I claim 1st, the machinery for measuring and lapping braids, tapes, etc. having a shifting and positive stop motion, substantially as herein described.

2d, The sliding shaft, a, the spring, c, the pin, g, and the cam, b, on the gear wheel, C, combined and operating substantially as and for the purposes herein described.

65,860.—STREET LANTERNS.—J. P. Avery and W. L. Nichols, Norwich, Conn.

We claim, 1st, The combination with the lantern head or frame of air tubes, b, arranged for supply of air to the flame substantially as specified.

2d, The independent frames, D E, in combination with the rope or cord packing, d, arranged to fit a groove, c, in one frame and clamped or held together to hold the frame in between them essentially as herein set forth.

65,861.—FEED ROLLERS FOR LAMP WICKS.—Charles H. Bagley, Elgin, Ill.

I claim a tooth or pronged roller drum or cylinder, made from a strip or strips of sheet metal or other suitable material provided with teeth along one or both of its edges and spirally wound into the form of a cylinder or other equivalent shape, substantially as and for the purpose described,

65,862.—NON-FREEZING WATER GATES.—Alfred M. Bailey, Middlefield, Conn.

1st, I claim the within described method of protecting moving parts from freezing, the same consisting in enclosing the parts at or near the water level within the casings which contain a fluid supported by the water and not liable to congelation, while the water outside of said casing stands at or near the same level and is prevented by said casings from displacing the same, substantially as and for the purpose herein specified.

2d, I claim floating either form of the enclosed tube and connected parts of the above described apparatus so that it shall rise and sink with the water in which it is supported or with the ice which becomes attached thereto, substantially as herein specified.

65,863.—DEVICE FOR TAPPING CEMENT-LINED PIPES.—Geo. H. Bailey, Jersey City, N. J., assignor to the American Water and Gas Company.

1st, I claim the combination of the tap, D, bored through from end to end, with the combination iron and cement pipes, substantially in the manner and for the purpose described.

2d, The constructing the flange, a, upon the tube or nipple at an intermediate point between the ends thereof, as shown in Fig. 4 of the drawings, so that when the device is applied to a cement lined pipe the cement lining shall not be liable to break off in tapping, substantially as described.

65,864.—WOOD TURNING LATHES.—Frederick Baldwin, Brattleboro', Vt

1st, I claim the method as herein substantially described, of operating the cutters, on the rotating disk, A', by means of the dogs, h k, the spring, l, the toe, J, the collar, o', the pin or rod, p, and the arm, L, which are moved and operated by the the revolving pattern through the rod, m.

2d, I claim the clutch, V, which is placed between two bevel gears, for the purposes described and which is operated by a shifting lever and a sliding bar substantially as set forth.

65,865.—COTTON PRESSES.—W. C. Banks, Como Depot, Miss.

I claim in combination with a cotton press substantially such as described, the pivoting at one end of the beam that carries the screw plates and sweeps, and the curved guide, or frame, F, and windlass and cords, or their equivalents for moving said beam, substantially as, and for the purposes herein described and represented.

65,866.—HYDRO-CARBON FLUID FOR CARBURETING GAS.—John A. Bassett, Salem, Mass.

1st, I claim a hydro-carbon liquid used for the purpose above named, produced by the combination of the coal and petroleum hydro-carbons, as described and set forth.

2d, Adding to the photometric valve of gases by carbureting with the hydro-carbons produced by the combination of the light products of the distillation of coal and petroleum.

3d, The process substantially as set forth of manufacturing hydro-carbons for carbureting gases by combining the hydro-carbons of coal and petroleum in variable proportions as set forth.

65,867.—CORN HUSKER.—E. M. Bates, East Rochester, Ohio.

I claim a curved or scroll corn husker constructed in the manner and for the purpose described.

65,868—CORN SHELLER.—F. A. Bolles, Unadilla, N. Y.

I claim combining with a stationary concave a yielding shelling cylinder, by means of springs as shown and described, said springs may be made of rubber or steel or any other suitable material, when constructed as and for the purpose as herein specified.

65,869.—METHOD OF SUPPLYING LOCOMOTVE TENDERS WITH WATER.—Walter J. Brassington, Brooklyn, and William Burtnett, New York City.

1st, I claim an air tight tender tank of a locomotive engine, provided with a pipe communicating with the locomotive boiler, also with devices for attaching a pipe which is designed to lead into a reservoir or well of water, for the purpose of supplying said tank with water, substantially as described.

2d, The combination of the secondary air tight water tank, E, and its spray pipe, f, with the primary tank, C, substantially in the manner and for the purposes described.

3d, The arrangement with an air tight tender tank, C, and pipes A and D, of reservoir, G, which is constructed to operate substantially as specified.

65,870.—WASHING-MACHINE.—Alex. Brooks, Waverly, N. Y.

1st, I claim The combination of the circular slats, or ribs, B, circular plates, C, and breast beams, D, with each other, and with the box, A, of the machine, substantially as herein shown and described and for the purpose set forth.

2d, The pivoted hammer, E, and weight, H, constructed arranged and operated substantially as herein shown and described in combination with the box, A, as and for the purpose set forth.

65,871.—POCKET SUN SHADES.—James W. Browne, N.Y.City.

1st, I claim the annular folding sun shade constructed substantially as herein set forth and for the purpose specified.

2d, In combination with the annular folding sun shade, the elastic inner edge, substantially as herein set forth for the purpose specified.

65,872.—AIR PUMPS FOR MARINE ALARMS.—Samuel G. Cabell, Quincy, Ill.

I claim the double acting air pump constructed substantially as described and charged with a dense fluid packing in combination with the draft and blast whistles, G, I, substantially as and for the purpose set forth.

65,873.—COPYING PRESSES.—Samuel G. Cabell, Quincy, Ill.

I claim the slotted eccentric, E, and roller, a, combined and arranged with relation to the platen, G, and bridge, H al constructed and operating substantially as herein set forth.

65,874.—STEAM GENERATOR.—Thomas S. Clogston, Boston, Mass.

I claim a boiler or steam generator composed of one or more generators, A, in which the upright or circulating flues steam chamber or chambers and lower arched flue are arranged substantially in the manner herein specified.

I also claim the combination with the boiler or steam generator, of the tubular casing surrounding the fuel supply door, substantially as and for the purposes set forth.

65,875—CULTIVATOR.—B. C. Cochran T. W. Cochran, and J. M. Cochran, Pana, Ills.

1st, We claim the metallic frame, D, with seat, E, plates, a a, plow frames, G G, and plows, I I, all constructed, arranged and operating in the manner and for the purposes herein specified.

2d, The shovel frames, G G, arranged with rods, H H', and m, for shifting the loops, b b, and levers, F F, for elevating the shovels in the manner as set forth.

65,876.—CARRIAGE.—Caleb Conderman, Hornellsville, Ills.

I claim the springs, E, in combination with the body or frame, A, substantially as and for the purpose described.

65,877.—RICE CULTIVATOR.—George W. Cooper, Ogeechee, Ga., assignor to himself and James V. Jones, Herndon, Ga.

1st, I claim the combination and arrangement of the braces, A B B', and the braces, G G, substantially as and for the purpose described.

2d, The method above described of fastening the teeth, E E E, to the beams by two bolts, situated obliquely to the grain of the wood substantially as and for the purpose specified.

3d, The inclining and bending of the cultivator teeth, E E, outward and backward upon the point of attachment to the beam, A B B', substantially as and for the purpose described.

65,878.—MEAT MANGLE.—G. A. Cover, Macomb, Ills.

I claim a meat mangle, consisting of the corrugated roller, R, provided with the cogs, c, and the sliding plate, B, provided with the cogs, s, and having its surface roughened when arranged to operate as described.

65,879.—MANUFACTURE OF BELTING.—James B. Crane, Dalton, Mass.

I claim as a new article of manufacture a belt for machinery formed of paper with or without cloth substantially as herein shown and set forth.

2d, The use of paper for belt-lacing when formed substantially as herein described.

65,880.—PURIFICATION OF COAL GAS.—Alexander Angus Croll, London, England.

I claim the employment in the purification of coal gas of wood or vegetable matter when carbonized substantially as herein described.

I also claim the employment of sulphate of lime in combination with the said carbonized matter, substantially as and for the purpose described.

65,881.—CHEESE VAT.—J. H. Crumb and L. Sears, De Ruyter, N. Y.

We claim the employment of cast iron heaters, B, in combination with pipe, b, hot water jacket, c, and milk vat, C c, constructed substantially as and for the purpose set forth.

The float, f, in connection with supply pipe and valve, d, e, heaters, B, and milk vat, C, as and for the purpose herein described.

65,882.—CAR COUPLING.—Geo. E. Cuming, La Fayette, Ind.

I claim the combination in an automatic car coupling of the draw head, A, hinged piece, B, stirrup, C, and spring supporting the same with the shackle bar, D, said parts being respectively constructed and arranged substantially as set forth.

2d, The draw head, A, when constructed with an opening through its lower side at A2, for the escape of the shackle bar substantially as described.

3d, The hinged piece, B, when constructed and used in combination with a draw head and shackle bar substantially as described.

65,883.—COMPUTING MACHINES.—A. W. Davies, Cleveland, O.

1st, I claim the series of reciprocating cams, H, and pawls, G, in combination with the ratchet wheels, F, and pin, a, arranged and operating conjointly with the endless chains, J, substantially as and for the purpose set forth.

2d, The lever, M, and pawl, G, as arranged in relation to each other and the ratchet wheel in disengaging or breaking the connections of one chain from the other for the purpose set forth.

3d, The endless belt or chain composed of sections corresponding to the faces or sides of the master wheels and so arranged as to operate conjointly with the figure wheels substantially as and for the purpose specified.

65,884,—MODE OF CONDENSING NOXIOUS VAPORS FROM LARD RENDERING, &c.—Samuel Davis, New York City.

1st, I claim the arrangement of cistern, A, the coil, B, and the pipes, C E D, and F, in combination with a kettle or boiler for the purposes herein described.

2d, Discharging a stream of water into the discharge pipe of a boiler for the purpose of increasing the draft from the boiler substantially as described.

65,885.—STEAM ENGINE GOVERNORS.—Thomas S. Davis, Jersey City, N. J.

I claim the combination of the plate, G, having a scroll H, with the bar, I, pin, a, arranged to operate across or at right angles or nearly so to the same, substantially as and for the purpose described.

65,886.—INSULATORS FOR TELEGRAPH WIRES.—Alfred B. Day, Oak Creek, Wis.

I claim the lugs, B and F, made of glass or other suitable non-conducting material in combination with the wooden plug, C, on the inside of the cast iron cylinder, A, all made and operating substantially as herein shown and described.

2d, So constructing the shell, A, that the cap, G, can be held down by the cross head, I, when the insulator is attached to the same all as herein shown and described.

65,887.—TREADLE FOR SEWING MACHINES AND OTHER PURPOSES.—Noel B. Devol Marshall, Ill.

I claim the ratchet wheel, H, secured to the crank shaft, B, of a sewing machine arm, I, having spring pawl, 12, pitman rod, K, supplementary treadle, J, and spring, M, or its equivalent when all combined and arranged together so as to operate substantially as and for the purpose described.

65,888.—ROOF FOR RAILROAD CARS.—Charles Dummeldinger, Cleveland, Ohio.

I claim the stay bands, E, tubular ends, C, as arranged in combination with the sheath, F, and car roof, A, for the purpose and in the manner set forth.

65,889.—COMBINED SEWER, PLANTER AND CULTIVATOR.—Daniel Duncan and E. R. Ridgley, Olney, Ill.

We claim the shaft, G, having the fixed armature, H, working the secondary bottom of the seed box, D, and having the sliding armature, K, regulated by means of the lever and treadle, I, substantially as and for the purpose described.

2d, The ring, F, on the end of the roller, E, provided with projecting arms f f f f, substantially as described.

3d, The division of the shaft, M M', to which are attached the drill teeth, into two equal parts M and M,' independent of each other and regulated by means of their respective treadles, n, n', substantially as and for the purpose described.

4th, The combination and arrangement of the spring L, the secondary bottom of the seed box, the shaft, G, with its two armatures, K and H, and the roller, E, having the ring, F, with its arms, f f f f, attached substantially as and for the purpose specified.

5th, The combination and arrangement of the drill teeth attached to the shafts, M M, the seed box, D, and the rollers, E E', substantially as and for the purpose specified.

65,890.—SASH SUPPORTER.—James H. Durham and Sanford Rising, Lafayette, Ind. Antedated December 18, 1866.

We claim a rubber cam having a V-shaped recess, wherein is placed the spring, E, as constructed with screw pivot, G, passing through the collar, C, with a wing, c, for spreading the spring, when arranged between the plates, A, in the manner and for the purpose set forth.

65,891.—WAGON-SPOKE MACHINE.—Chas. C. Dupue, Wayne, Mich.

I claim securing the spoke in position to be acted upon by means of the pivoted dog, R, substantially as herein shown and described.

65,892.—COMPOUND FOR TEMPERING STEEL.—William G. Esser, Milwaukee, Wis.

I claim a compound for tempering steel tools, composed of the above ingredients in about the proportions named.

65,893.—STRAW CUTTER.—William H. Evans, Richmond, Ind. Antedated June 10, 1867.

1st, I claim the rock shaft, E, slotted arm, F, pawls, 1 and 2, and spring, L, in combination with the eccentric wheel, D, and feed roller ratchets, J and K, arranged and operating substantially as set forth and described.

2d, The stop, G, arm or lever, H, and rack, I, in combination with the rock shaft, E, as and for the purpose set forth.

65,894.—FASTENING FOR PAPER COLLARS.—Charles R. Everson, Palmyra, N. Y.

I claim a fastener for collars composed of plate, B, having a clasp, D, hinged to it, and provided with a loop, G, substantially as described.

65,895.—BELTING.—C. J. Fay, Philadelphia, Pa.

I claim the use of and the manner of arranging paper for belts and straps, substantially as described.

65,896.—VEGETABLE LIFTER.—Christopher C. Fellows, Centre Sandwich, N. H.

I claim as my invention the new manufacture of egg or vegetable lifter, made as hereinbefore described, viz.: from one piece of wire bent at its middle, and also bent at or near its two ends in conical spirals or helices, as set forth.

65,897.—DEVICE FOR MEASURING LIQUIDS.—Albert Fickett and Justin C. Ware, Titusville, Pa.

1st, We claim the arrangement of the vessel, B, secured within the tank, A, and used in connection with a valve and stop cock, substantially in the manner and for the purpose specified.

3d, In combination with the above an indicator, arranged as and for the purpose specified.

65,898.—VISE.—Orlando V. Flora (assignor to himself and William A. Collins), Madison, Ind.

1st, I claim the rear jaw, D, constructed substantially as herein described, in combination with the support, B, and sliding bar, C, as and for the purpose set forth.

2d, The front jaw, G, pivoted at its lower end to the lower end of the vertical pin, bearing the nut, F, and fitting in the vertical hole of the sliding bar, C, as herein set forth for the purpose specified.

3d, The combination and arrangement of the front jaw, G, short screw, H,

nut, F, and sliding bar, C, with each other, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the key, J, with the end of the sliding bar, C, and with the pivoting pin of the nut, F, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the support, B, sliding bar, C, and jaws, D and G, with each other, substantially as herein shown and described and for the purpose set forth.

65,899.—CHURN.—Conrad George, Ligonier, Pa.

1st, I claim the combination of the double alternating levers, J K L, and the partitioned churn box, A, all arranged substantially as and for the purpose set forth.

2d, I claim arranging the levers J K L, in a diagonal position as shown for the purpose of bringing the working ends of the levers, K L, over the centers of the churn divisions, A A', as and for the purpose set forth.

3d, I claim the combination of the perforated dashers provided with the valves, R R and S S, having the movements described, with the partition, B, furnished with the holes, b' b', and beveled slits, c' c', substantially as and for the purpose set forth.

65,900.—CALIPER RULES.—A. W. Goddard, Clinton, Mass.

1st, I claim the blades a a, when arranged as and for the purpose described.

2d, The combined caliper and slide gage rule, when arranged substantially as and for the purpose set forth.

65,901.—LIFE-PRESERVING MATTRESS.—John Golding, New York City.

I claim the life raft constructed as described, consisting of the cork mattresses or floats, secured together by means of the spring hooks a, and staples b, as herein set forth for the purpose specified.

65,902.—WINDOW SASH.—D. R. Gould, Chestertown, N. Y.

I claim the strips C C, secured upon the face of the sash by means of screws, in combination with the grooves d d, in the frame, as and for the purpose set forth.

65,903.—PESSARY.—W. G. Grant, Clyde, Ohio.

I claim a sponge pessary, made of conical shape A, outside, and provided with the hollow, B, substantially as described for the purpose specified.

65,904.—FLOOR CLOTH.—Thomas Griffin, Roxbury, Mass.

I claim a floor covering or imitation oilcloth, made substantially as herein described.

65,905.—CLOTHES DRYER.—R. Hamblin, Mishawaka, Ind.

I claim the combination of one or more sets or tiers of jointed radial arms D, and the supporting or connecting wires E and F, or their equivalent, with each other, and with the central shaft, A, substantially as herein shown and described and for the purpose set forth.

65,906.—CONVERTIBLE STOVE DOOR AND FENDER.—C. Harris and P. W. Zoiner, Cincinnati, Ohio.

1st, We claim the convertible stove door and fender, substantially as set forth.

2d, The arrangement of convertible door and fender A B F, and hearth depressions D and E, substantially as represented and described.

65,907.—COMBINED MILK RACK AND FRUIT DRYER.—C. B. and G. W. Hart, Victor, N. Y.

We claim the combined milk rack and fruit dryer, provided with loosely pivoted slats forming the sheives, capable of being opened or closed by the wedge bar beneath, the whole constructed and arranged as described, and operating in the manner set forth.

65,908.—ELEVATED RAILWAY.—Charles T. Harvey, Tarrytown, N. Y.

1st, I claim the combination of the rail plates or supports J J, with the rails I, and bars M, when constructed and arranged substantially in the manner and for the purpose herein set forth.

2d, I also claim the elastic plates or springs R, in combination with the rails, constructed and arranged substantially in the manner herein described.

3d, I also claim the platform frame E, with its upright ends or flanges O, in combination with the rails, constructed and arranged substantially as herein described.

65,909.—ELEVATED RAILWAY.—Charles T. Harvey, Tarrytown, N. Y.

1st, I claim the combination with the track of an elevated railroad of an open or transparent floor beneath the rails, so as to allow the transmission of light to the space beneath the railroad, substantially as set forth and described.

2d, I also claim the panels D, in the columns A, for the purpose of closing the openings in the lower part of the said columns, and also to strengthen the columns, substantially as set forth and described.

3d, I also claim the adjustable column A, made in the divisions a b, substantially as described.

4th, I also claim the wedge-shaped rings C, or their equivalents, in combination with the adjustable column A, substantially as described.

5th, I also claim the hollow supporting columns A, in combination with an elevated railroad, substantially as and for the purposes described.

6th, I also claim the pulleys, T, in combination with the supporting columns A, substantially as and for the purposes described.

7th, I also claim the combination of the stay rods V, with the elevatd railroad, said stay rods connecting said railway to the buildings or other supports on the streets, and forming also awning frame supports, substantially as set forth.

8th, I also claim a filling of wood or equivalent material, in combination with said columns, substantially as and for the purposes described.

9th, I also claim the water trough along the track and its discharge pipe in combination with an elevated railway, substantially as and for the purposes described.

65,910.—CARRIAGE.—James Hatfield, Cleveland, Ohio

1st, I claim the centers, a', constructed with radial arms, b, in combination with the bands, B, spoke, d, and keys, f, substantially as and for the purpose described.

2d, The wheel B, spindle C, as arranged in combination with the stays D, boxes E E', for the purpose and in the manner as set forth.

3d, The cross rail K, arm L, links L', and brackets M, in combination with the stay D, and screw G, as and for the purpose substantially as herein described.

4th, The stay D, screw pins, I G, in combination with the spindle C, axle tree A, substantially as and for the purpose set forth.

5th, The adjusting screw O', coupling O, and reach K', arranged substantially as and for the purpose set forth.

65,911.—STEAM PUMP.—William N. Henderson, Philadelphia, Pa.

1st, I claim the arrangement of the pump steam cylinder and housing as described.

2d, The arrangement of a vacuum chamber enveloping the pump canal, substantially in the manner and for the purposes represented.

Third, The arrangement of the cross-head arm E, connecting rod, F, eccentric pin shaft K, and slot-headed valve stem J, when constructed and operating conjointly in the manner and for the purposes herein set forth.

65,912.—AMALGAMATOR.—R. W. Howard, Warwick, R. I.

1st, I claim the stationary or fixed pan A, having its bottom provided with radial grooves a, and an annular gutter or trough B, around its edge, in combination with the rotating pan E, fitted within A, and provided at its exterior with flanges I J, and holes h, in its upper part, and provided at its center with an upright hollow hub F, having holes g, in its lower part to admit the pulp down between the bottoms of the two pans, all arranged substantially as and for the purpose specified.

2d, The adjustable jacket G, on the hollow hub, F, operated by the screw H, in combination with the fixed plate K, in the pan E, substantially as and for the purpose set forth.

65,913.—BOLT TRIMMER.—Henry Howe, Oneonta, N. Y.

I claim the cam-shaped sharply-beveled knife C D, pivoted to and in combination with the bar A B, having a hole in B to receive the object to be trimmed by the knife C D.

65,914.—FURNACE FOR BURNING PYRITES FOR THE MANUFACTURE OF SULPHURIC ACID, AND FOR OTHER PURPOSES.—John Hughes, Edgewater, N. Y.

I claim constructing a furnace for burning pyrites or sulphurets of iron, copper, zinc, or other metals, without the aid of fuel, in the form of an inverted truncated cone, without grate bars, and provided with doors on the front side, ranged one above the other from top to bottom, substantially as and for the purpose set forth.

65,915.—CHURN.—Aaron Huyck, Ourtown, Wis.

1st, I claim the bridge D, stepped in loops C C, and provided with the box, F, secured by thumb screws L, all constructed and arranged as set forth.

2d, The bridge D, post N, shafts E I, pinions J G, driver B, and shaft N, constructed and arranged as set forth.

65,916.—EGG CUTTER.—Francis L. King, Worcester, Mass.

I claim the combination of two or more cutter shafts B, having cutters E, attached, with the gearing C D E, arranged and operating essentially as set forth.

65,917.—METHOD OF COVERING WHIPS.—Gamaliel King (assignor to himself and Charles C. Pratt), Westfield, Mass.

1st, I claim a waterproof coating, consisting of the ingredients herein shown and described.

2d, The application of the dissolved caoutchouc, with or without the lead and oil, to a whip, substantially as and for the purpose shown.

65,918.—CULTIVATOR.—Joseph Koehn, Canton, Ohio.

I claim, 1st, The frame A, with diagonal bars A' A', for connecting the shovels D D, when constructed in the manner and used for the purpose set forth.

2d, The arrangement of the lever e, spring t, pin z, in combination with the axle b, rack s, for the purposes specified.

65,919.—MACHINE FOR DRESSING LEATHER.—Charles Korn, Wortsborough, Ind.

1st, I claim the harpeners f and l, when arranged on a sliding block G, either separate or in combination with the cleaner e, all made and operating substantially as herein shown and described.

2d, The knife or knives E, when secured obliquely upon an endless apron, and when arranged in combination with the obliquely set frame F F', and grooved block G, in such a manner that the said block is moved by the knife, substantially as set forth.

3d, The up and down adjustable frame F F', in combination with the sliding block G, and knife or knives E, all made and operating substantially as herein shown and described.

4th, The block G, and knife or knives E, in combination with the spring m, and frame F F', all made and operating substantially as herein shown and described.

5th, The knife or knives E, when arranged on an endless apron A, in combination with the sliding block G, and sharpeners f and l, and cleaner e, all made and operating substantially as herein shown and described.

65,920.—FILING MACHINE.—Thomas H. Lindley, Taunton, Mass.

I claim the combination of the sliding carriages C C', supported in the adjustable bearings B B, and operated by the wheel l, and the adjustable table m, supported and applied substantially in manner and for the purpose as set forth.

65,921.—STEAM VALVE.—Thomas H. Lidford, North Adams, Mass.

I claim the arrangement of the wedge-shaped pieces D and E, with reference to the shaft G, and collars d and e, substantially as described.

65,922.—APPARATUS FOR FORMING MOLDS FOR THE PURPOSE OF CASTING METAL.—Albion H. Lowell, Manchester, N. H.

I claim, in combination with the pattern attached to the plunger, as set forth, the endless chains C, the plates s, the stops or bars t n, the tube or punch c', and the flask F, as above set forth and described and for the purpose of making molds for castings.

65,923.—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—Alexander Mackey, New York City.

1st, I claim the combination with the centrifugal cylinder of a stationary distributer, arranged within the cylinder on one side of it, adjacent to the feed, and operating substantially as specified.

2d, The stationary distributer, C constructed essentially as shown and described, in combination with the centrifugal cylinder B, and arranged in relation thereto as herein set forth.

65,924.—MODE OF FORMING EMERY WHEELS.—C. G. Marshall, Florence, Mass.

I claim the use of concrete lime or cement in the formation of emery wheels, substantially as and for the purpose herein set forth.

65,925.—CAR WHEEL.—G. B. Massey, New York City.

1st, I claim a car wheel composed of the disk A, having the solid hub A', with the disk B fitted to turn loosely on the hub and held thereon by the cap C, as set forth.

2d, The car wheel, consisting of the disk B, provided with the flange e, in combination with the disk A, having the solid hub A', said disks A and B, being held together by means of the cap C, substantially as described.

65,926.—MACHINE FOR COATING HATS.—Jules Francois Mathias and Desire Mathurin Legat, Paris, France.

1st, We claim a machine for felting hats, made and operating substantially as herein shown and described.

2d, The hollow shaft K, combined and connected with the shaft H, by means of springs R R, substantially as herein shown and described.

3d, The beating apparatus P, in combination with the spring Q, substantially as herein shown and described.

4th, The arrangement of the valve e, and passage or conduit f, in combination with the channel F and face B, all made and operating substantially as herein shown and described.

65,927.—MANUFACTURE OF ILLUMINATING GAS.—George A. McIlhenny, Washington, D. C.

1st, I claim the prevention of the deposit of carbon in gas retorts by the means described or by any equivalent means.

2d, I claim so arranging the pipes or tubes leading from the retort to the hydraulic main that the mouths of said pipes or tubes can be sealed or unsealed at pleasure.

3d, I claim providing the hydraulic main of a gas factory with two or more pipes for the escape of the coal tar, when said pipes are arranged at different hights and provided with cocks so that the liquid contents of the main may be made to occupy a higher or lower level therein, substantially as and for the purpose set forth.

65,928.—IDENTIFYING BOX.—Levi T. McNieley, Danville, Mo

I claim an identifying box constructed substantially in the form herein described, for the purpose of identifying and aiding in the securing of lost animals and goods.

65,929.—WEATHER STRIP.—Isaac H. McOmber, El Paso, Ill.

I claim the arrangement of the false rim C, with the grooved door cleats H H, and the strip D, substantially as and for the purpose set forth.

65,930.—METHOD OF ADJUSTING ROLLERS.—Samuel M. Mecutchen, Philadelphia, Pa.

I claim the arrangement, substantially as described, of the wedges, sliding bearing b, and set screw f, with a rolling mill, for the purpose specified.

65,931.—BRICK MACHINE.—Jonathan Mills, Des Moines, Iowa, assignor to himself, Lewis J. Brown, Charles S. Spofford, and Henry Van Lutheran.

1st, I claim the horizontal pug tub or mill, constructed and arranged substantially as described, in relation to the mold wheel and the other parts of the machine, substantially as herein shown and described.

2d, I claim dropping back the follower or relieving the brick of pressure, substantially as and for the purposes specified.

3d, I claim the arrangement, substantially as shown and described, by which the apron is operated, as and for the purpose set forth.

65,932.—STUD FASTENING.—Benjamin Moser and David Yellott, Brooklyn, N. Y.

We claim the fastening for buttons, etc., herein described, the same consisting of the arms D D2, and spring or other suitable catch, substantially as specified.

65,933.—LAMP BURNER.—George Neilson, Boston, Mass.

I claim the combination with the jacketed wick tube and rack for adjusting the wick of the cap or deck forming the base of the jacket above the apertures through which the rack pin passes, such deck being depressed so as to constitute a cup which gathers and holds the condensed vapor around and against the wick tube, as and for the purposes herein described.

65,934.—TANNING COMPOUND.—William H. Newby, Seymour, Ind.

I claim the tanning liquid composed of the ingredients in or about the proportions substantially as described.

65,935.—LAMP.—E. D. Norton, Bradford, Pa.

I claim a safety valve constructed and applied substantially as and for the purpose described.

65,936.—MELODEON, ETC.—Amos Nudd, Waupun, Wis.

I claim in combination with the keyboard of a melodeon, or similar reed instrument, the sounding box C, arranged as shown and described.

65,937.—ROCKING CHAIR AND TRUNK.—Thomas Nye, Westbrook, Me.

1st, I claim the movable back a, and folding arms, b, operating as described and for the purposes specified.

2d, The rockers s n, when constructed so as to fold up and also to fold into the recess, substantially as and for the purposes set forth.

3d, The drops e, to hold upright the part h, of the back in the manner and for the purposes set forth.

4th, The double cover m x, when applied to the trunk body to close the recess, substantially as and for the purposes described.

65,938.—CULTIVATOR.—Lorenzo D. Pelton and Joseph Barrow (assignors to themselves and Alexis Green), Harrison, Ohio.

1st, We claim a mode of construction whereby the wheels and secondary beam B, may be detached, and by means of auxiliary bolt holes c, in the handles C, and in the sheaths at c', the handles lowered to a convenient hight to be managed by an operator on foot.

2d, In combination with the elements of the clause immediately preceding, we claim the provision of the described mechanism for lifting the plows from the ground, either temporarily to pass an obstacle, J J', or more permanently to allow of moving the implement on a road or otherwise, F F' H h and I, add the position of the seat, which enables the driver to control these levers and manage the plow handle.

65,939.—MACHINE FOR PRODUCING BLAST IN GAS CARBURETERS AND OTHER APPARATUS.—E. A. Pond and M. S. Richardson, Rutland, Vt.

1st, We claim a vessel or case divided into two compartments, communicating with each other at or near the bottom of the vessel.

2d, A hollow shaft or arbor passing through the two compartments, having mounted upon the sides of the dividing partition a series of convolute tubes, and provided on the other side with one or more perforations, the said shaft being connected with suitable mechanism for rotating it.

3d, One or more suitable valves for the admission of air, and pipes for the discharge of the compressed air or gas.

65,940.—MACHINE FOR HEADING CARTRIDGE CASES.—Timothy I. Powers, (assignor to J. P. Fitch and J. R. Van Vechten), N. Y. City.

1st, I claim in cartridge heading machines the combination with the header J, and shell mandrel or series of shell mandrels, h, arranged and operating together substantially in the manner described, of the sectional or divided die, N, arranged to gripe or close round the shells on the mandrel or mandrels before and whilst the shell is being upset and headed, and afterwards to open for release of the latter, essentially as specified.

2d, The combination with the shell mandrels and header of an automatic gage or shell adjuster, arranged so as to set the closed end of the shell to its proper position relatively to the upper or outer end of the mandrel in advance of the action of the header upon the shell, substantially as and for the purpose herein specified.

3d, In combination with a series of shell mandrels and suitable header, a shell take-off, K, constructed to operate essentially as described or in any other equivalent manner.

4th, The combination of the vertical slide, E, divided or sectional die, N N, and header, J, with the locking and unlocking devices operating upon the sectional die, all constructed and arranged substantially as and for the purpose herein set forth.

5th, The fixed way, M, in combination with the lever, q, for closing the sectional die by the movement of the slide, E, which carries the said die, substantially as described.

6th, The slide, L, and stop, o, in combination with each other, and with the levers, q, for opening the die and moving it out of the way of the header, essentially as herein set forth.

65,941.—FORGING APPARATUS.—John Price, N. Y. City.

1st, I claim the combination with the hammer head of a rack spring and sliding catch, substantially as and for the purpose set forth.

2d, Operating the sliding catch, J, by means of the lever, g, which connects and disconnects the power for driving the hammer, the said lever, g, being connected for that purpose to the sliding catch, J, by the arm, a, rock shaft, b, arm, e, and connecting rod or link, f, or by their equivalents in such a manner that the said sliding catch, J, will be thrown inward to catch the hammer when the power is disconnected and drawn out to release the hammer when the power is applied by the lever, g, substantially as and for the purpose set forth.

65,942.—MACHINE FOR GRINDING AND POLISHING.—Thomas Prosser, New York City.

1st, I claim the combination of the wheels, s s', pawls, u u', friction wheels, p h, and screw, I, with the reciprocating carriage for establishing an automatic feed motion, substantially as described.

2d, The reciprocating carriage, F, with its frame or vise, G, made adjustable thereon, parallel or angularly to the axis of the grinding wheel in the manner described.

3d, The friction gear wheels, h p, made adjustable as regards their binding action, one upon the other, substantially as and for the purpose set forth

65,943.—BRICK KILN.—Stephen D. Rader, Williamsport, Pa.

I claim the peculiar construction and arrangement of furnaces, B B and C C, when used in connection with the kiln, A, as and for the purpose specified.

65,944.—ESCAPEMENT FOR TIME-PIECES.—Herman Reinecke, New York City. Antedated June 10, 1867.

I claim pallets, p p', mounted on the oscillating arbor, b, in combination with the lever, C, lifting spring, f, pins, d e g e, and balance, B, all constructed and operating substantially as and for the purpose described.

65,945.—SECTIONAL MOLDS FOR PUTTING UP BUILDINGS OF CONCRETE AND OTHER MATERIALS.—John R. Richards, Mount Joy, Pa., assignor to himself and Alfred L. Mennez, Cleveland, Ohio.

I claim a series of sectional molds, A B, for the outer face, and another series, H I, for the inner face of walls, in combination with the door, window boxing, M N, strips, K, dovetailed joists, J J, all arranged substantially as united by flanges, F, in the manner shown and described.

In combination with my sectional molds, I also claim the open interstices when made for the admission of carbonic acid gas for the purpose specified.

I also claim the proportions specified for making the composition when introduced between sectional molds, in the manner and for the purpose set forth.

65,946.—APPARATUS FOR TEMPERING STEEL PLATES.—Christopher Richardson, Newark, N. J.

I claim the combination of the plates, C and D, with the screw or screws, K, and the heated chamber, U, or their equivalents, when combined and operated substantially as and for the purpose described.

65,947.—HAND SAW FRAME.—Christopher Richardson, Newark, N. J.

I claim the improved method of holding saws in metallic saw frames, substantially as shown and described.

65,948.—MACHINE FOR COATING PAPER WITH MUCILAGE, ETC.—Henry E. Rile, (assignor to Asa L. Shipman), New York City.

I claim a machine for coating paper, etc., in which are combined a frame carrying a series of brushes whether one or more in number, a platform or table and a reservoir or receptacle for the liquid to be applied by the brushes when all are combined and arranged together so as to operate substantially as described.

65,949.—BURGLAR ALARM.—Henry R. Robbins, Baltimore, Md.

I claim the combination of the frame, A, spring piston hammers, B B, lever catch, E, hinged trigger, D d, and spring, g, constructed and operating substantially as described and represented.

65,950.—DOUBLE SEAMING MACHINE.—J. Rupp, (assignor to himself and Frederick Kteeser), New York City.

1st, I claim the movable slide, d, carrying the supporting plate, f, in combination with the disk, A, constructed, arranged and operating substantially as and for the purpose described.

2d, The arrangement of three or more cone rollers, i, in the annular rim, H, in combination with the rising and falling disk, A, constructed, arranged and operating substantially as and for the purpose set forth.

Third, The clamping roller, p, in combination with the burring roller, o, and disk, A, constructed, arranged and operating substantially as and for the purpose described.

65,951.—LOCOMOTIVE ENGINES.—S. Samuels, Mott Haven, N. Y., and W. J. Brassington, Brooklyn, N. Y., assignors to themselves, William Pitt, and W. B. Burtnett.

1st, We claim the combination with the tank of a locomotive engine tender of an air pump so arranged as to admit of being worked by the engine for the production of a vacuum in said tank, substantially as herein set forth.

2d, The combination with a locomotive engine and its tender of a pump so arranged as to serve either purpose at pleasure of exhausting air from the tank to facilitate the supply of water to the latter, or of forcing water from the tank into the boiler, substantially as herein set forth.

3d, In combination with the water supply pipe, B, and its stop cock, d, the air pipe, D, connected with the pipe, B, in front of the said cock, d, essentially as shown and described.

65,952.—CUTLERY.—William Sanderson, New York City.

I claim a handle formed of a metallic frame, cast with or rigidly united to the bolster, and scales or side pieces, substantially as described.

65,953.—APPARATUS FOR SUPPLYING AIR TO LIFE-BOATS.—Peter F. Schenck, Riceville, N. J.

I claim an apparatus consisting of tubes containing ball valves of different specific gravity, adapted to operate in combination with a closed life boat, for the purpose of admitting fresh air therein and excluding water therefrom, substantially as described.

65,954.—WOOD PLANING MACHINE.—Frederick Schmidt, Cincinnati, Ohio.

I claim the elongated gains or depressions, e e, in the two parts of a divided cutter, to enable the said parts to be set out in opposite directions, substantially as and for the purposes set forth.

65,955.—MANUFACTURE OF ORNAMENTAL FEATHERS.—F. Emil Schmidt, Hoboken, N. J.

I claim ornamental feathers which have been colored in a printing press, and which are treated substantially as herein shown and described.

65,956.—COMPOSITION FOR ROOFING, PAVEMENTS, WALLS, DOCKS, AND OTHER STRUCTURES.—John See, Baltimore, Md.

1st, I claim the composition formed of the materials named, substantially as and for the purposes herein specified.

2d, Iron ore turnings, borings, or filings in combination with hydraulic cement for the formation of roofing, pavements, walls, docks, water bricks, pipes, and other structures, substantially as and for the purposes herein specified.

65,957.—INSTRUMENT FOR OPENING SHEET METAL CANS.—Frederick Seymour, Nashville, Tenn.

I claim the new article of manufacture, consisting of the guard, F, in the described combination with the shaft, A, handle, B, elbow, C, point, D, and cutter, F, whether stationary or adjustable.

65,958.—ICE PITCHER.—Michael Simons, Middletown, Ct.

I claim the inside bottom, P, and the outside bottom, G, with its devices H and L, when arranged and constructed as herein described and for the purpose set forth.

65,959.—FRUIT LADDER.—Daniel C. Smith, Adrian, Mich.

I claim a fruit ladder as shown and described with bars, H, braces, P, and handle, U, as set forth in the specification and drawings; and in combination.

I claim, secondly, the support, N, or any thing substantially its equivalent for the purposes set forth and described.

65,960.—WASHING MACHINE.—Abram C. Stannard, Rock County, Wis.

1st, I claim straight edged eccentrics, J and J, when made substantially as described and used to hold the working mechanism, I, P and K, of a washing machine to any desired altitude within the washing machine box, A, and the whole combined and operated substantially as and for the purposes described.

2d, The general arrangement of box, A, rollers, S, arranged in frame, R, wash-board, Q, and operating frame work, M, P, J, K, and U, kept to any desired altitude by means of the straight-edged eccentrics, J and J, when the whole are constructed, arranged and operated substantially as and for the purposes described.

65,961.—CULTIVATOR.—U. T. Stewart, Fayette Co., Tenn.

I claim the arrangement of the spring sword, F, F, and the combination of ploughs and scrapers, B, B, two of the scrapers being chopping scrapers, B, B, so as to perform the work above specified.

65,962.—CYLINDER PRESS FOR EXTRACTING OIL FROM FISH.—J. G. Stoddard and B. F. Gallup, Groton, Conn.

We claim the arrangement and combination of the cylinders, C and D, the apron, B, the hopper, F, and the scraper or chute, G, substantially as described and for the purposes herein set forth.

2d, I claim the recesses, b, in combination with the cylinders, C and D, substantially as and for the purposes specified.

65,963.—SLEEPING CARS.—John Swan, Baltimore, Md.

I claim in a railway car of a series of state rooms, provided with side passage and independent ventilation, the combination and arrangement of reservoir pipes, H, H, and basins, G, in the state rooms, as and for the purpose specified.

65,964.—BED BOTTOM.—T. P. Thompson, Charlestown, Mass.

I claim the combination with the slotted cylindrical sockets and springs contained within the same, of slats having heads or knobs on their end, fitting into the side sockets under the arrangement described, so that while the said slats are capable of a free vertical play, their heads shall at all times be held within the said sockets as specified.

65,965.—TOOLS FOR JEWELING WATCHES.—D. B. Tiffany, Xenia, Ohio.

1st, I claim an adjustable arm through which the cutters work, secured to either side of the vise, substantially as and for purposes set forth and described.

2d, An adjustable arm, d, provided with a set screw, a, and secured to the side of the opposite to the former, substantially as and for the purposes set forth.

3d, The combination of the two adjustable arms with circular tap, e, and nut g, operating as and for the purposes specified.

65,966.—SORGHUM STRIPPER.—George Tollinger, Wrightsdale, Pa.

I claim the construction and arrangement of the ring-plate, C, and braces D, D, supporting the scraper blades, a, a, a, a, a, which are secured to the yielding spring braces, d, d, d, d, the whole being attached to the board or plank A, all in combination operating substantially in the manner herein described for the purposes set forth.

65,967.—FURNACES.—C. W. Trotter, (assignor Gommenginger & Trotter,) Rochester, N. Y.

1st, I claim the peculiar construction of the main body, A, in connection with the inner body, a, with triangular flues, n, n, n, n, n, all in the manner and for the purpose herein described.

2d, I claim a double radiator, C, connections, o, o, and double damper, k and l, with rod, m, also two tiers of smoke pipes, d, d, d, and e, e, e, all in the manner and for the purpose herein set forth.

65,968.—ROLLERS FOR ROLLING OLD RAILS.—J. P. Verree and W. A. Mitchell, Philadelphia, Pa.

We claim in three high rolls series of grooves in each roll, shaped substantially as described.

We also claim grooves of the particular form represented by Figures 1 and 2, produced respectively by the conjunction of the groove of one roll with the groove of another.

65,969.—CHIMNEY COWL.—John A. Waggoner, Kilgore, O.

I claim the wings, A, plate, D, and sides, E, when constructed and arranged in combination with a chimney, as and for the purpose set forth.

65,970.—BEDSTEAD FASTENING.—J. B. Wardwell, Georgetown, D. C.

I claim the mortise plate constructed with a rotating side to close upon the neck of the dovetail tenon of the rail, and to open to permit the withdrawal of the tenon, substantially as described.

65,971.—RING SPINNING FRAME.—Joseph W. Wattles, Canton, Mass.

I claim as my improvement in the ring spinning frame, or machine, the application of the ring, B, to its support rail, A, in such manner that while the spinning of the yarn or thread and the winding of it upon the bobbin, may be in the act of taking place, the ring may be free to be moved and centralized with respect to the bobbin, by the draft of the yarn on the traveler.

I also claim the combination of the screws, g, and the slots, f, or their equivalent, with the ring and its rail and with the ring socket, so formed as to allow the ring to play diametrically as and for the purpose set forth, the purpose of such screws and slots being as herein before explained.

65,972.—HINGES FOR LAMP BURNERS.—Wm. Webb, (assignor to the Scoville Manufacturing Co.), Waterbury, Conn.

I claim the hinge, A, having one of its leaves provided with a projecting rest or stop-piece, D, and made substantially as herein described and for the purpose specified.

65,973.—PRINTER'S INK.—M. Weissberger, St. Paul, Minn.

I claim the printer's ink above described, compounded and used substantially as and for the purposes specified.

65,974.—GATE.—S. H. Wheeler, Dowagiac, Mich.

1st, I claim the frame, E, with its rocker, A, in combination with the revolving post, D, as and for the purpose herein specified.

2d, The combination of the frame, E, with the gate and its posts and the cleat, x, or its equivalent, as and for the purpose set forth.

65,975.—BED BOTTOM.—Chas. W. White, Cincinnati, Ohio.

I claim the combined arrangement of the two sets of transverse slats, A and C, the springs, B, siderails, D D', and screws, E, as and for the purposes set forth.

65,976.—SEED AND GUANO PLANTER.—Thomas W. White, Milledgeville, Ga.

I claim, 1st, the drum, G, having the internal movable disk, T, bearing the teeth, t' t', and adjusted by set screws or their equivalent, substantially as and for the purpose described.

2d, The saw, H, attached to the drum, G, substantially as and for the purpose described.

3d, The bottom plate, N, substantially as described.

4th, The hinged block, K, operated by the cam, L, substantially as and for the purpose specified.

5th, The combination and arrangement of the drum, G, the movable disk, T, the hinged block, K with the flexible bag attached to it, and the cam, L, substantially as and for the purpose described.

65,977.—MANUFACTURE OF HARVESTER GUARD FINGERS.—W. N. Whiteley, Jr., Jerome Fassler, and O. S. Kelly, Springfield, Ohio.

We claim, 1st, Guard fingers for harvesting machines made by the process and order of manufacture herein described.

2d, A harvester guard finger composed of a central portion or core of soft iron and its entire outer skin or surface of hardened steel, substantially as and for the purpose set forth.

65,978.—NIPPLE SHIELD.—C. H. and J. M. Wilder, New York City.

We claim, 1st, The arrangement of a screen, a, in combination with the nipple shield, A, substantially as and for the purpose described.

2d, The adjustable slide, C, in combination with the screen, a, and nipple shield, A, substantially as and for the purpose described.

65,979.—CLOTHES DRYER.—Hosea Willard, Vergennes, Vt.

I claim the securing of the clothes bars, B, in the stirrups, c, of the bracket by means of oblong staples, d, or their equivalents, to admit of the longitudinal adjustment of the bars in the stirrups, substantially as and for the purpose specified.

65,980.—SPRING HINGE.—Alvah Wiswall, New York City.

I claim the spring, D, combined with the bar, E, arm, C, provided with a friction roller, a, and the hinge, all arranged to operate in the manner substantially as show and described.

65,981.—MECHANICAL POWER.—A. B. Wood (assignor to himself, W. W. Wood, and W. H. Wood), Hamburg, Ark.

I claim the interposition of intermediate mechanical parts or gearing between the point of direct application of power and the point at which an increase of power is attained and applied for the purpose of increasing the capacity of power of any given motor, engine, or machine, when the same is effected substantially in the manner and by the means herein described.

65,982.—BRUSH.—E. J. Worcester (assignor to himself and Wm. S. Porter), Worcester, Mass.

I claim, 1st, The combination of handle, G, and back, B, with a removable metal connection piece or socket such as described, which can be readily applied to either end of the back of the brush without injuring or defacing the same, for the purposes stated.

2d, The combination of the back, B, and handle, C, with the bent metal socket or connection piece, E, and flanges, a a, substantially as and for the purposes set forth.

65,983.—WAGON BRAKE.—G. S. Ziegenfuss, Doylestown, Pa.

I claim, 1st, The brace, F, in combination with the lock bar, E, and bolts, f, or their respective equivalents, substantially as described.

2d, The pole, H, carrying the lever, K, and rack, h, in combination with the cord, k, pulleys, l l, and lock bar, E, or their respective equivalents, substantially as described.

3d, The combination of two or more independent brakes applied to a wagon or other vehicle, adjusted so as to be brought into play either separately or together, substantially as described.

65,984.—INKING APPARATUS FOR PRINTING PRESSES.—G. W. Wood, Richmond, Ind.

I claim, first, sector plates, E, E1, E2, adjustably arranged in sets for transferring the ink from the fountains and disposing the colors or bands upon the type rollers.

2d, The combination upon one shaft of the sector plates and cam wheels, C C'.

3d, The combination of the ink fountain rollers, a corresponding number of sector plates and a type inking or other receiving roller or rollers.

65,985.—WINDING WATCHES.—C. V. Woerd (assignor to the American Watch Company), Waltham, Mass.

I claim a key having a screw formed upon its shank to work into a screw thread formed in the watch pendant, or in a nut inserted in the pendant, substantially as shown and described.

I also claim forming a key to be directly connected with and disconnected from the pendants, with its means of attachment integral with or projecting from the shank, substantially as shown and described.

Also, the combination of the nut, r, and key, B, arranged substantially as set forth.

Also, making the block or nut, through which the key extends, movable vertically as and for the purpose substantially as described.

65,986.—HOOP SKIRT.—Abraham Trager, New York, N. Y.

I claim the use of ribbed or corrugated wires for hoop skirts, either with or without any kind of coating or covering, as herein described.

REISSUES.

2,647.—MACHINE FOR MAKING NAILS AND TACKS.—Orin L. Bassett, T. R. Bearse and W. B. Wilber, Taunton, Mass. Patented Oct. 9, 1866.

1st, We claim the combination of a carrier or bearer for the tack blank with any one of the cutters, be they more or less in number, used for cutting the tack blanks, when arranged so as to operate substantially in the manner and for the purpose specified.

2d, The carrier or bearer for conveying the tack blanks to the die to be headed, in combination with a forked or other suitable lever, arranged with regard to the said carrier and so as to operate upon it and with the cutter, substantially as and for the purpose described.

3d, The lever, S, pivoted to either a fixed or movable fulcrum, in combination with the carrier, Q, cam shaft, D, forked lever, Y, and cutter, substantially as described for the purpose specified.

2,650.—REVOLVING FIRE-ARM.—Wm. H. Elliot, Plattsburg, N. Y. Patented May 29, 1860.

1st, I claim a fire-arm with revolving barrels which are bored through and chambered so as to be charged at the breech and sustained by two supports, to wit, one point of support being at the center of the breech plate, or at the rear of the breech-loading chambers, and the other forward of said chambers, such construction of barrels and supports obviating the use of a pin passing through the cluster of barrels, of sufficient strength alone to support the same, substantially as set forth.

2d, The arrangement of support, n, in the rear of all the barrels, and support, n', in front of all the barrels, in combination with a series of revolving barrels which are bored through at their rear ends, for the purpose of being charged at the breech, substantially as set forth.

3d, The employment of a hammer arranged as specified in relation to the barrels, when used independent of a breech pin or nipple, and in combination with chambers bored through at their rear ends, and with a breech plate, substantially as specified.

4th, The combination of a wedge or cam, j, with a fly, f, for raising the hammer, substantially as specified.

2,651.—FAGOT FOR RAILROAD RAILS.—John Price and Wm. Lewis, Danville, Pa. Patented Oct. 28, 1862.

We claim a form or formed piece for a fagot to be rolled into a railroad rail with flanges forming part of the form piece, projecting downward from each side or edge thereof, and over both sides or edges of the layer or layers directly beneath it, said form piece being intended for the head or tread of the rail and the layer or layers specified to the body thereof, substantially as and for the purpose shown and described.

We also claim a railroad rail made from a fagot constructed substantially as above set forth.

2,652.—CLOTHES WRINGER.—Ann Jane Sargeant, administratrix of the estate of I. A. Sargeant, deceased, Dayton, Ohio, assignor to Sylvenus Walker, Newark, N. J. Patented July 27, 1858.

1st, I claim the yoke, B, provided with a suitable hitching arm, the said yoke being adapted to be temporarily attached to a wash tub or readily disconnected therefrom as explained, and employed as a bearing for a rotary clamp for wringing clothes.

2d, In the described connection with the yoke, B, the movable clamp, H I J K L, and pawl and dog, P Q, by means of which the said clamp is retained within the yoke, or may be readily removed therefrom at will, to be cleaned or dried.

3d, In the described connection with a rotary clamp for wringing clothes, the hinged and yielding hitching arm, E, for the purposes explained.

2,653.—CORSET SKIRT SUPPORTER.—J. H. Foy and L. H. Foy, Boston, Mass., assignees by mesne assignments of Livinia H. Foy. Patented Sept. 15, 1863. Division 1.

1st, We claim the binding cloth cut bias as described, in combination with the exterior or outer edge of the rim, L, to which the binding cloth is applied as specified, whereby all gathering is avoided, while a corded appearance and a case for the hoop, M, are produced, substantially as set forth.

2d, The combination of laced openings, K K, or either of them, with the front part of the body, I, of a corset open in front, substantially as set forth.

3d, The body, I, open in front and adjustable both in front and the back by means of laced openings, substantially as shown and described.

4th, Forming the curve for the hoop and corded edges, O and P, for the same piece of bias cut cloth, as shown and described.

2,654.—CORSET SKIRT SUPPORTER.—J. H. Foy and L. H. Foy, Boston, Mass., assignees by mesne assignments of Livinia H. Foy. Patented Sept. 15, 1863. Division 2.

1st, We claim protecting and securing the ends of the stiffeners, whalebones or springs, which are inserted in pockets in the body of corsets, by by means of caps, p, the body, flange, and spurs of each of which confine the stiffener or spring in position and prevent its wearing through the fabric, substantially as set forth.

2d, Protecting and securing the ends of the stiffeners, whalebones, or springs, which are inserted in pockets in the body of a corset by means of metal caps applied to the outside to prevent the said stiffeners from wearing through the fabric, substantially as described.

2,655.—SEWING MACHINE.—James E. A. Gibbs, Midway, Va. Patented Aug. 10, 1858.

I claim the general arrangement of a sewing machine comprising the parts whereby the sewing mechanism is brought into operative relation, substantially as herein shown and described, that is to say, combining with the vibrating needle arm a frame shaped substantially like the roman letter G, as herein shown and described and for the purposes set forth.

I also claim so constructing and combining or arranging and operating a revolving hook or looper with a reciprocating needle as that one loop shall be taken from the needle after the former loop shall have been drawn up, on, along, or over the needle during its advance movement, in the manner and for the purpose substantially as described.

I also claim the conical sleeve or its equivalent, for holding the spool and for revolving therewith, in combination with the adjustable cones, F and G, or their equivalents, for producing the requisite degree of friction upon the conical sleeve spool holder, when constructed and arranged so as to operate substantially in the manner and for the purposes herein set forth.

2,656.—WEAVING CORDED FABRICS.—Wm. Smith, New York City. Patened April 5, 1853. Extended seven years.

I claim the process herein specified of weaving, consisting in the use of stationary warps in combination with the moving warps and filling that form a fabric on each side of such stationary warps, substantially as set forth.

DESIGNS.

2,674.—PLOW CLEVIS.—G. P. Darrow (assignor to James L. Haven & Co.), Cincinnati, Ohio.

2,675.—CLOCK CASE.—A. C. Felton, Boston, Mass.

2,676.—COMBINED HAMMER, TACK DRAWER, WRENCH, ETC.—Anthony Iske, Lancaster, Pa.

2,677.—SOLDIER'S MONUMENT.—Dayton Morgan, Chillicothe, Ohio.

2,678.—POST-OFFICE BALANCE.—W. W. Reynolds, Brandon, Vt., assignor to the Howe Scale Compmy.

2,679.—COUNTER SCALE.—W. W. Reynolds, Brandon, Vt., assignor to the Howe Scale Company.

2,680.—COOK'S STOVE.—Samuel Saylor, Philadelphia, Pa., assignor to Francis Buckwalter & Co., Royer's Ford, Pa. Antedated June 4, 1867.

2,681.—TEA OR COFFEE POT.—Geo. Jones, Saugerties, N. Y.

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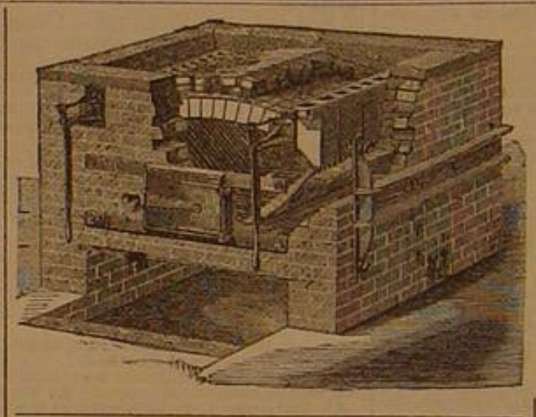
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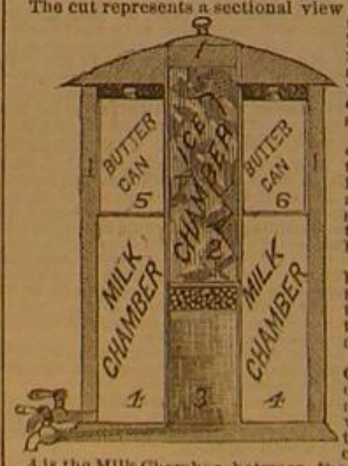
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ELDER'S COMBINED MILK COOLER AND BUTTER PRESERVER.

This valuable invention for keeping milk cold and sweet in warm weather is the subject of three patents, dated Aug. 21, Sept. 4, and Dec. 4, 1866. It combines all the advantages of a compact Refrigerator; is a beautiful ornament; can be kept in the living or dining room, thereby saving many steps; and will become a necessity in every family, boarding house, hotel, steamboat, where milk is used. It is simple in construction, can be sold at a cost within the reach of every family, and will keep milk sweet in the warmest weather, at a small cost for ice.

DESCRIPTION OF THE CAN.

The cut represents a sectional view of the can, showing the arrangements inside. The can is round, in shape and appearance like a water cooler, and can be made of any size required.



1 represents the outer rim, a double tin or galvanized iron case, filled with a non-conducting substance, to keep the cold in and the heat out.

2 is the Ice Chamber—a circular tube, fastened to the bottom and passing through the lid, with a separate lid to it.

3 is the Water Chamber, where the drippings of the ice are collected. The water is drawn from this chamber by a cock.

4 is the Milk Chamber, between the outer rim and central ice chamber; the milk is drawn by a separate cock.

5 and 6 are movable cans, made to fit closely around the ice chamber. These cans are to hold butter, berries, vegetables, or any article needed in a family. They can be taken out either separately or together, or left out entirely if required.

THE ADVANTAGES OF THIS CAN ARE:

First, Its economy in the use of ice. The ice being separated from the water, will last much longer than in an ordinary water cooler, and being in the center of the can, all its cooling properties are saved.

Second, Milk is kept sweet, unadulterated with water, nearly ice-cold, in the warmest weather, in the dining or living room, convenient of access. Buttermilk can be kept as well as sweet milk.

Third, The cans in the upper part of the milk chamber will keep any article used in a family without additional cost for ice.

Fourth, The water filtered from the ice will furnish the family with ice water.

Fifth, This is a compact refrigerator, that will keep any article required in a family, and supply them with sweet milk and ice water at a less cost for can and ice than any other known invention. It can be placed in the dining room, or where the milk is most used, convenient to the servant, and milk can be drawn in large or small quantities as needed.

The attention of Manufacturers and Dealers is called to this valuable invention. There will be no limit to its sale when its advantages are known.

The can was exhibited last fall at the Indiana State Fair, at Indianapolis, and the Illinois State Fair, at Chicago, in both of which it received the first premium, and the commendation of all that examined it.

For a description of this cooler see Scientific American, April 27, 1867, page 276.

The undersigned, sole owners of the above patent, will sell single cans, with the right to use them, or they will sell the exclusive right to make, sell, and use the cans in any County or State, on reasonable terms. For further information address ELDER & BRADSHAW, Indianapolis, Ind.

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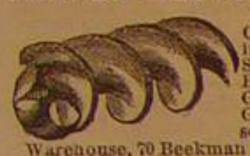
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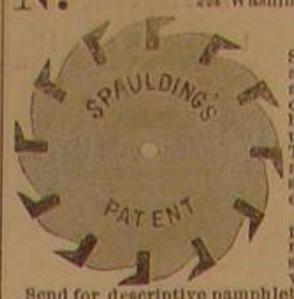
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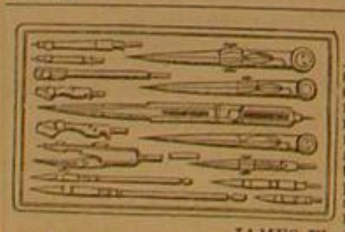
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Ventilated Cooling Apparatus.

Some country houses are so fortunately situated as to have conveniently at hand a never-failing spring, a stream from which, conducted through a proper building, cools the atmosphere and preserves milk, butter, meats, vegetables, and fruits in a fresh condition. The ordinary ice refrigerator in other cases supplies this want, but as ventilation—a continual circulation of air—is not always assured, it is not, under all circumstances, so good.

The apparatus shown in the annexed engravings is intended as a substitute for the spring house, and insures a constant passage of water-cooled air through the receptacle. Fig. 1 shows a box or receptacle intended to receive beer and ale in places where they are kept for use or sale. The receptacle may be of any required size. A tank, A, seen in Figs. 1, 2, and 3, holds a supply of water which is allowed slowly to drop or run through a faucet at the end into a shallow reservoir—B, Fig. 2—from whence it passes to a water grate seen in perspective at, C, Fig. 3, which is placed directly under the tank, A. From the bars of this grate depend sheets of ordinary gauze in light frames—D, Figs. 1 and 2—which are kept saturated by the water that drips from the grate and falls into the lower tank, E, from whence it is pumped up again by the hand pump, F. The cool air enters through the pipe G, Fig. 1, and passes in the direction of the arrows through the wet gauze, where it is cooled, through the receptacle, and out of the escape pipe, H, Figs. 1 and 3 in the latter case into the chimney.

VILLARD'S SUBSTITUTE SPRING HOUSE.

Fig. 1.

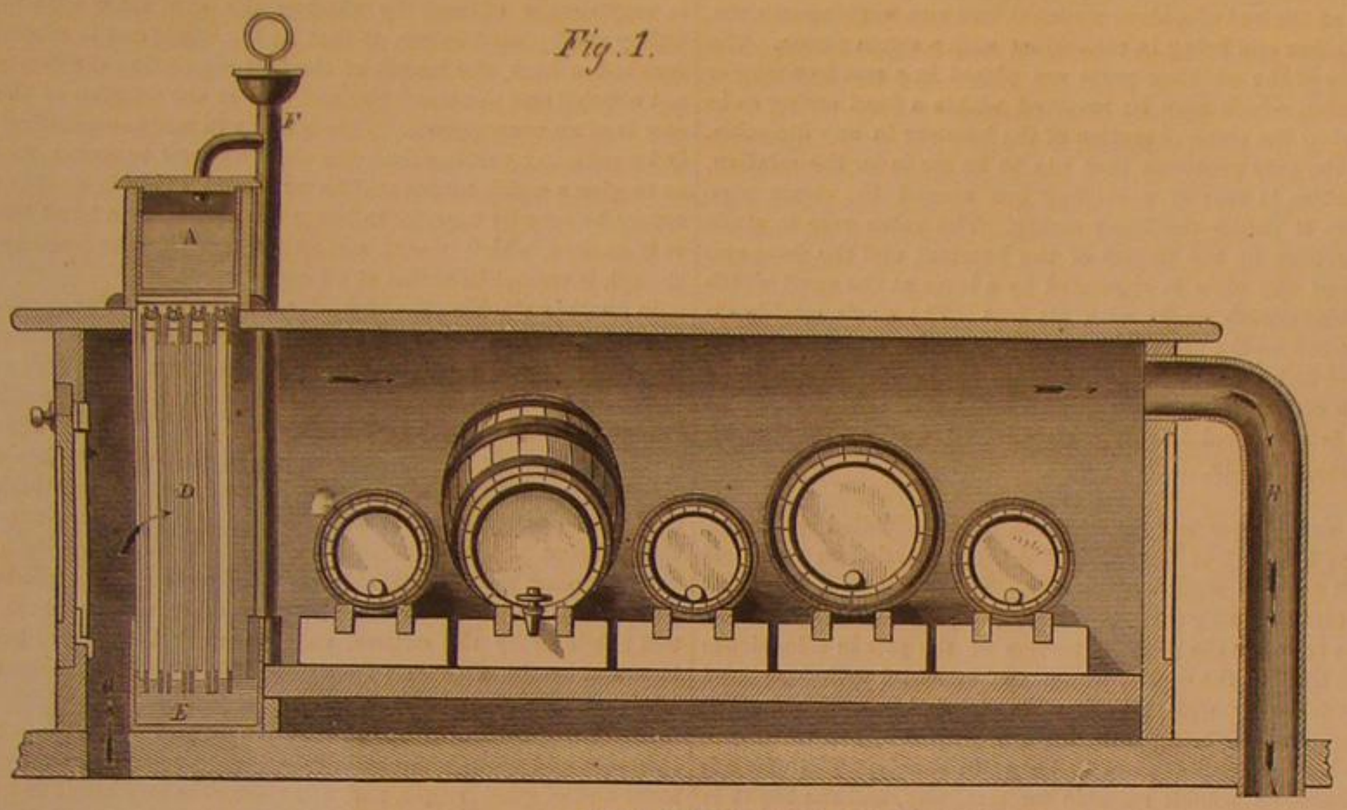


Fig. 2.

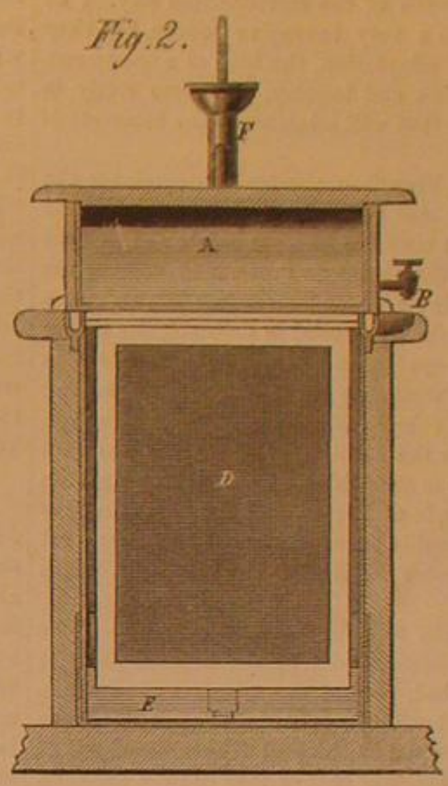


Fig. 3.

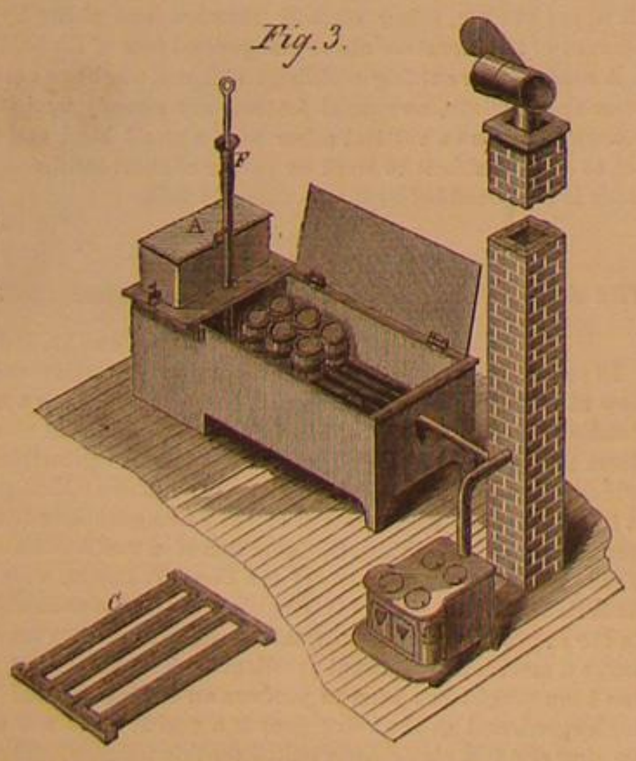


Fig. 3 more particularly represents an adaptation of this device to the dairy or buttery. It is readily understood without further explanation. It is not difficult to comprehend that articles of food can be in this manner preserved in hot weather without contracting any of that close, musty, and disagreeable flavor which is detected often in those kept in the ordinary ice chest. For milk from which butter is to be made, especially, this apparatus would seem to be well adapted. It can in this be kept pure for a sufficiently long time to allow all the cream to rise without being tainted with sourness.

This contrivance was patented through the Scientific American Patent Agency May 29, 1866, by Frederick Villard of Canton, Ohio.

VILLARD'S ROTATING CHIMNEY CAP.

The object of this is a cheap, strong, and sightly ventilator for a chimney top to secure a good draft at all times. Fig. 1 is a sectional elevation and Fig. 2 a cross section at the top of the chimney. The flat, square top, A, is secured to the brick work by long bolts, B, held by clamps C, at the bottom ends. The circle inside the square has an inward projecting lip which receives the ring of the revolving part D. This arrangement prevents the upper portion or bonnet from being displaced by the wind. From the movable ring rise three arms holding a long central socket, E, in which a spindle turns and receives the whole weight of the cap. A vane keeps the funnel opening always facing the wind, which being contracted in volume as it passes through, creates a very strong draft. In Fig. 3 of the preceeding description the cap is seen in perspective affixed to a chimney top. This invention was patented through the Scientific American Patent Agency, March 5, 1867, also by F. Villard, who will reply to all communications addressed to him, relative to the Air Cooler or Chimney Cap, care of J. Abbott, box 69, Canton, Ohio.

Fig. 1.

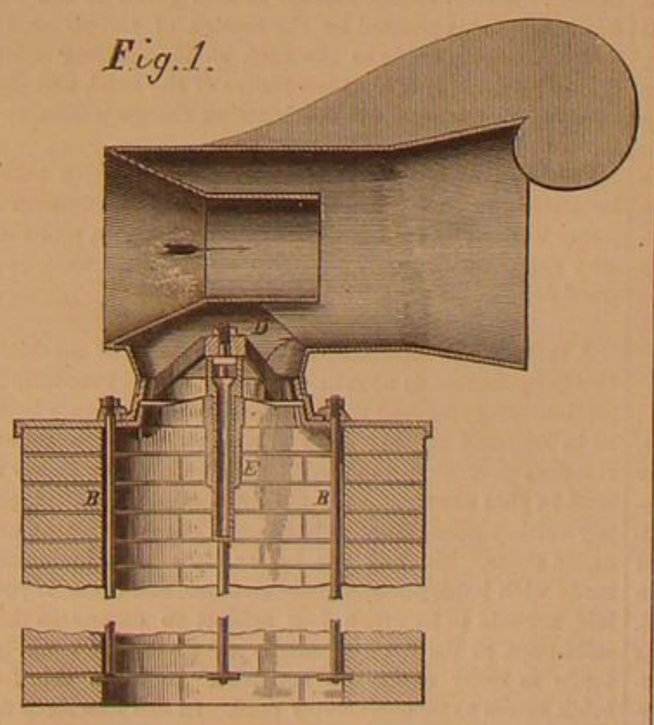
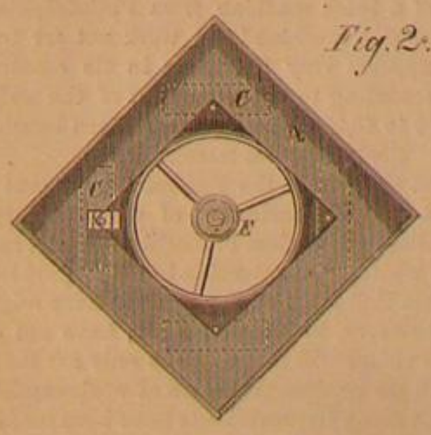


Fig. 2.



The Amazon.

There is a little colony of Englishmen settled at Iquetos, on the Amazon, 3,500 miles from its mouth. William Clark, an English (or is he a Scotch?) engineer, who once worked at Penn's, and who was for some years the chief engineer of the Peruvian Government, organized an exploring expedition, two or three years ago, to the upper waters of the great river, and is now resident with his companions at Iquitos, in the Peruvian territory. He took out two steamers, boats, machinery, etc., and was accompanied by fifty volunteer soldiers, and by a number of British workmen and their families. The settlement is nearly as far off and is as romantic as was Robinson Crusoe's. There are plenty of cannibals (?) near, and some twenty-five of these rascals were shot in a single day's adventure. Mr. Clark has a foundery and engineering works, and has built and launched a floating dock for the repair of his vessels. From his letters, the upper Amazon appears to be a magnificent country, promising a splendid future. His steamers run regularly down the Amazon, and keep him and his colony well supplied with whatever they require from the outer world. Mills and machinery are already in demand in the neighborhood. Mr. Clark receives his *Engineering* with tolerable regularity. The last time we had the pleasure of seeing him it was in company with poor Holliday, formerly Penn's out-door engineer, and who, while chief engineer of the Ross Winans cigar ship, was lost one night in the Thames, when returning to his ship from Northfleet. Mr. Clark is likely to make a name in Peru.—*Engineering.*

EDITORIAL CORRESPONDENCE.

Ancient and Modern Paris—The Napoleon Family—The Exhibition—The Czar and King William—The Great Review—The Attempted Assassination.

PARIS, June 8, 1867.

I suppose that no other city of ancient or modern times has undergone so many changes as Paris during a period of ten years. The Paris of history is passing away and a new city full of wonders and beauties is rapidly coming in. Twenty years ago Louis Napoleon was tried as a conspirator and condemned to death. Louis Philippe commuted the death sentence to perpetual imprisonment in the fortress of Ham, whence the convict escaped, as is supposed, through the friendly contrivance of his physician. In 1848 Louis Napoleon was the ruler of France, and Louis Philippe became an outcast and a fugitive from his throne and country. In the meantime France has made rapid strides in all that constitutes a great and powerful nation. Her commerce is widely extended, her manufactures are flourishing, and to all appearance the people are happy and contented. There is, however, a great diversity of opinion about the personal popularity of the Emperor; yet I think, on the whole, that he satisfies the people. It is generally admitted that his fillibustering expedition to Mexico was an unwise and foolish scheme, and I am certain that the people rejoice at its failure. This constitutes one element that has somewhat impaired the faith of the French in the shrewdness of their Emperor. It also shows the practical value of the sympathy of the United States when extended to a struggling people whose liberties and rights were sought to be usurped by a foreign despot.

I remarked that the Paris of ancient time was rapidly passing away. If the visitor goes to the cathedral of St. Denis, he will find that revolutions have despoiled that place of many of its rarest objects of interest, and instead of the tombs of the ancient kings he will be shown the place where their remains were thrown into one common trench. If you visit the splendid Pantheon church, it is true you will find the monuments of Voltaire and Rousseau, but the remains

have been carried away, and the body of the bloody Marat, once entombed in this church, was exhumed, and in a freak of passion thrown into a sewer. These events occurred years ago, but they serve to verify the declaration I have made about ancient Paris. Architecturally the city is rapidly changing its character by the opening of broad boulevards, and the necessary destruction of those old streets and houses where revolutions have kindled their fiercest fires. This wholesale demolition has turned thousands of people out of their old homes, and they have been compelled to seek new ones and to separate from associations which had become tender to them by the lapse of time. This also has created a feeling against the Emperor, as he is charged with the responsibility of all these innovations, but no one can fail to see that these changes are making for Paris an interest which relics and ruins of ancient time could never accomplish.

There is, however, but one Paris. It is the capital of Europe, and seems to lie in everybody's way; for all the monarchs, from the time of Catharine de Medici to the present Emperor, have exhausted their genius and lavished their treasures to make it the great show-place of the world. Frenchmen throughout all France are proud of their capital and seem to regard it as the only proper residence for all mankind. There are no rival cities, as in the United States, to feel jealous of the growth of the metropolitan city. I do not regard the French as a very inventive people, but they have wonderful power of adaptation, the love of experiment, and the spirit of emulation and inquiry, and seem ready to adopt any improvements that will minister to the interests of strangers.

The more thoughtful French character contemplates the future of France not without some forebodings of evil; and some even declare that it may not be long before the Orleans family, in the person of the Count de Paris, may recover the rule of the nation. Louis Napoleon is growing old, and some say infirm. The little Prince Imperial is delicate, the Prince Napoleon is not very popular, and many profess to see in these manifestations of weakness signs of the approaching decay of the Napoleonic rule in France. I think, however, that those who rely upon the fulfillment of these signs will be disappointed. There is something in the name Napoleon which electrifies the people of France, and the great deeds of this family are so thoroughly traced upon all one sees, that it would require a greater revolution than has yet taken place, to erase them.

I think myself fortunate to be in Paris at this time. The Exhibition which was foreshadowed by the English press to be a failure, is, to my mind, one of the wonders of creation. The illustration of the building, recently published in the SCIENTIFIC AMERICAN, is one of the best I have seen.

I have thus far spent the best part of four days in attempting to see its objects of art and utility, and I can truly say that I have not seen the Exhibition, so vast is it, and as I shall leave Paris in a few days for a journey eastward through Prussia, Austria, and Switzerland, I reserve my impressions of it, possibly till some other time. I met an American the other day who has made forty visits to the Exhibition, and who declared that his interest was still unabated. I think what one can see in the various buildings outside the Grand Palace of Industry, such things as indicate the manners, trades, and customs of the older and ruder nations of the world, are full of marvellous interest. But Paris is interesting now from the fact that in all probability there are upwards of a half million strangers now in the city, and also from the fact that it contains two Emperors, a King and the Crown Prince of the three most powerful nations on the continent—Napoleon, Alexander the Czar of Russia, and King William of Prussia—and Prime Minister Count Bismarck, a man more feared in Europe than any of the crowned heads. *Charivari*, the *Punch* of Paris, facetiously announces the "arrival of Bismarck and his servant King William."

Napoleon has extended to his royal visitors a most marked and to all appearance a most cordial welcome. Balls, operas, reviews, and other exhibitions are constantly prepared for their entertainment, and the whole city is alive with excitement. Apart from the great influx of strangers, it is a mystery to me how so many French people can afford to idle about these displays of pageantry. The review at Long Champs on the 6th was perhaps the most brilliant that has ever occurred. At an early hour in the morning carriages and pedestrians were pressing their way by thousands toward the Park, expecting to gain eligible positions to witness the display. Having fortunately secured seats in the tribune, we did not depart from Paris until noon, which was two hours before the review. So great was the rush, however, we did not get to our position until half-past one. The police of Paris are much more skillful in managing a crowd than ours in New York. Had it been otherwise we could not have gained the places assigned to our party. There were sixty thousand troops, "horse, foot, and dragoons," drawn along in lines around a vast parallelogram, the whole being visible from the position we occupied. At the precise hour a flourish of trumpets announced the arrival of the reviewing party, which was composed of the grandees of Europe. The two Emperors and the King rode side by side at the front and were followed immediately by their suites—all mounted upon fine horses and dressed in brilliant costumes. Having passed around the entire inner line of troops, which occupied about three quarters of an hour, the reviewing party rode across the field and took a station immediately facing the tribune. Then commenced the movement of the entire military force, infantry, artillery and cavalry—passing immediately in front of the Emperors and King. The marching of the infantry, the rattling of the artillery, the grand charge of the cavalry, and the inspiring strains of the numerous bands of music, together with the brilliant uniforms of officers and men, produced a scene which those who witnessed it will never forget, and one that is not likely to occur again in Europe. The attempt made by a desperate young Pole—Berezowski—to take the life of the Czar as he rode away from the review, produced a most intense excitement, and before we were aware of what had happened we found ourselves surrounded and hemmed in by an agitated crowd who were pressing the officers as they attempted to to carry away the would-be assassin. It took us nearly an hour to get out of the confusion. The escape of the Czar was the subject of general joy, and the Parisians were especially thankful that the attempt was not made by a French subject.

S. H. W.

Special correspondence of the Scientific American.

MACHINE TOOLS AT THE EXPOSITION.

PARIS, June 4, 1867.

STEAM HAMMER.

A tool which from its novelty attracts considerable attention, is Davies' steam striker, designed to imitate as clearly as possible the action of a sledge, and to be able to strike a blow in any direction, so as to be applicable to work of irregular shape, or to forgings which are too unwieldy to be got under an ordinary steam hammer. The form of hammer head is retained as in a blacksmith's sledge, and this is carried at the end of a stout wrought iron arm working on a pin, the other end being in connection with a steam piston. The whole of the working parts are placed in a cast iron ring or cylinder, which may be revolved within a fixed casing so as to bring the plane of motion of the hammer in any direction, and the only provision that has to be made for the rotation, therefore, is that of a stuffing box around the steam pipe where it enters the inner casing. The valve gear is made self-acting by the impact of the hammer, and the force and time of the blow is regulated by a lever at the anvil which the blacksmith works with his foot. The whole machine is mounted on the top of a hydraulic ram, by which it can be raised or lowered a certain distance, or be turned around to work on a number of anvils placed in a circle about it. This tool is made and has been a good deal used at the Viaduct Works, Crumlin.

MINING MACHINE TOOLS.

A very simple tool for coal mining is exhibited by Messrs. Jones & Levick of Blaina. A flat pick is carried on a vertical shaft so as to work horizontally. The bearings of this shaft are cast on a ring arranged to revolve as in the steam striker, so as to bring the plane of motion of the pick in coincidence with that of the coal stratum. A horizontal cylinder placed concentrically with this ring is employed to work the pick; compressed air being used for the purpose. The valve gear is self acting and appears to be quite simple. The whole is mounted on wheels suitable for a railway, and the hight is not more than two feet.

By the side of this stands the rock-tunneling machine of Capt. Beaumont of the Royal Engineers, also driven by compressed air. It consists of a heavy circular head, carrying at its circumference as many as fifty drills, and receiving motion forward and back from the air piston, to the rod of which it is attached. A slow rotary motion is also given to the head by frictional parts operated by the motion of the piston, so that a circular rift is made in the rock as the drilling advances. A single drill is placed at the centre of the head, and the hole bored by this is used for the blasting charge necessary to remove the circular block.

Passing this, we come to a simple pump which throws an immense stream of water. It is merely a common chain pump with india rubber disks for the buckets, and these fitting the barrel tightly, yet without great friction, enable a good duty to be done without waste of power.

BRICKS AND BRICK MACHINES.

A large brick machine, or rather a series of machines, for this manufacture is next in order, and this is generally in operation. A great deal of attention has of late years been given in England to this class of machines, and a number of different forms are produced. As a rule, the ordinary bricks used in that country are of the most miserable kind, possessing neither strength nor comeliness, but good bricks are produced there. Many of the better class used for houses are made with holes passing through them, and these, if properly laid, are said to be much less subject to dampness than the solid ones, as the air has access to them more freely and tends to carry away the moisture. In Paris this form of brick seems to be exclusively used. In the American department, a model of a brick machine from Philadelphia is exhibited, and a full size machine is at work not far from the exhibition. It appears very ingenious in its construction, and is capable, according to the statement of the exhibitor, of making 35,000 to 40,000 bricks per day of ten hours.

WOOD-WORKING MACHINERY.

One of the best portions of the English department is that devoted to wood-working machinery, of which a very great variety is exhibited. This class of machines is one, as everybody knows, to which great attention has been paid in America, and it is there that most of the designs have originated. The English, however, in copying them, have not done so blindly, and the visitor will find that not only are these tools constructed with far greater perfection of workmanship than with us, but that many improvements have been made in the design of tools, besides the addition of some that are not in use in America. Most of these tools are in operation, and I notice that they are not afraid to give a high speed to the cutters, which will be acknowledged to be one important point in wood-working. To do this and at the same time have a durable machine, they claim that the bearings must be of ample dimensions and be fitted with nicety, and indeed the appearance of these tools is scarcely inferior to those designed for working in metals. One of the best, simplest and commonest tools is the band saw, and for some singular reason this is hardly ever used in America. It consists merely of an endless saw passing over two pulleys, one above the other, by which it is kept in tension and driven. One pulley is made adjustable so as to regulate the amount of tension, and is furnished either with a spring or a counterweight to allow of the expansion and contraction that necessarily occur from the heating and cooling of the saw when in use, without either causing the band to become loose and slip, or to snap from over-tension. The advantages of this tool are most obvious: as the motion is always in the cutting direction no time is lost in reciprocations, and for the same reason much more delicate work can be done with it, as there is no alteration of strain which would tend to break thin portions of wood, and, moreover, a fan is rendered unnecessary, as all the saw dust is carried down beneath the table. The pulleys generally have leather coating for the saw band to run on, though this is not always the case. The English are certainly ahead of us on this tool, for if, as I have heard it said, we have not been able to make it go, they have, and there is no shop of any consequence without it.

A good tool among those exhibited is a cross-cut circular saw for cutting off stuff to a gage, in which the saw moves up to the work instead of having to move the gage. This is very simply effected by placing the saw arbor with its pulley shaft placed below, so that as the upper end is moved forward or back, the length of the belt connecting the two is not affected and the small rise and fall in the position of the saw is of no consequence. This is made to move automatically by reducing gearing from the shafting, and in such a way as to give a quick return motion to the saw; but it would of course be equally possible to bring the saw up by a hand lever if desired, which would somewhat simplify the machine, though it cannot be called at all complicated.

In another machine the end of a circular saw arbor carries a slotting drill for mortising, acting on the same principle as those now so generally used for metal-working. The drill of course remains stationary, and the table on which the work is placed is moved back and forth by hand before it. This tool does its work very quickly and well, and only requires a second operation to square out the ends of the mortise, which is of course easily done under any of the ordinary tools for that purpose.

A tenoning machine capable of working at any angle is also shown. Two arbors, one above the other, with overhung tool heads, carry the cutters, and the work is traversed between them by a table with a gage by which the desired angle may be given to the plank.

Another good machine is one for planing at one operation the sides and edges of a piece of stuff. The arbors are made stout and of good length, and this allows the tool heads to be overhung without injury to the stability of the machine. The heads are forged solid with the arbors, but have a hole bored out of the centre of them which reduces their weight materially. The feed is driven by a friction gear, bearing against the face of a large disk, and this arrangement enables the speed to be varied while the machine is in operation, instead of making it necessary to shift the belt, as in some tools. For this purpose a screw is provided, by turning which the friction gear is brought nearer to the centre of the disk and so receives a slower motion from it. In this way the speed may be easily reduced from 25 ft. to 10 ft., when the workman sees a loose knot or anything that would endanger his cutters. This may also be used for tonguing and grooving staves for circular work. The arbors of the two tool heads working on the edges of the stuff are made so that they may be set at any angle, according to the width of the stave or the diameter of the cylinder of which it is to form a part, and the two are necessarily inclined at the same angle. Into the iron table of this machine, directly under the cutters for plaining the upper side of the stuff, is dovetailed a piece of hard wood, its upper surface, being slightly rounded and rising by the amount of its curvature above the general face of the table.

A machine for cutting moldings either straight or curved, presents, I believe, no special feature not already familiar in America. It has a vertical arbor with a small head and cutter, so as to enable it to work on curves of short radii, and the work is traversed before it on a suitable table.

SLADE.

THE ALLEN-PORTER-WHITWORTH HIGH-SPEED ENGINE.

PARIS, June 11, 1867.

In one of my earlier letters I alluded to the Allen engine now at work in the Exposition, and promised to give a more detailed description of it at some future time. I will now redeem that promise and endeavor to explain the principles on which it is constructed. The distinctive feature which gives it its name is the arrangement of the valve gear for advantageous expansive working, the invention of a well known New York machinist of that name. Mr. Chas. T. Porter, who has undertaken to introduce it in England, has however combined in the engine a number of qualities which together tend to make a machine of unusual excellence. The first object that has been sought has been to produce an engine adapted to a high speed, and as the valve gear is a positive and not a detaching one it is particularly suited for this purpose. The advantages of high speed theoretically considered are quite obvious, since weight, space, and cost are all saved by setting a small engine working rapidly to do the work of a large one moving slowly. The difficulty however has been to produce an engine in which it was possible to maintain a high speed without a destructive wear and tear of the parts. A high speed engine must have no rattle traps about it, must have ample bearings and wearing surfaces, and all its adjustments must be such as to have no slack, though without the intro-

duction of any superfluous keys or adjusting pieces which may either work loose or put it in the engineer's power to spoil his engine. These points and others which will appear as we proceed, have been kept carefully in mind in the design of this engine. First, in reference to the valve gear. It is well known by all familiar with the subject, that the use of a single slide valve to accomplish the admission, suppression and release of the steam to and from the cylinder is only possible when we are willing to sacrifice something of the peculiar characteristics which we should wish each of these elements of the distribution to have. In all engines therefore in which a correct distribution is sought ,the attempt to make a single valve accomplish so many different functions is abandoned, and in most cases, as in the Corliss, Sickles and other arrangements, four separate valves are set to admit and release the steam. This is the plan also which is adopted in the Allen engine, although as both exhaust valves are worked by a single stem, we might perhaps regard them as but a single valve in effect. A single eccentric moves all the valves, but the motion imparted to them is modified by interposing between each steam valve, eccentric rod and its valve stem, a bell crank rock shaft. The cut-off is varied by the govern or raising or lowering the ends of the rods which we have called the eccentric rods, in a curved slot or link formed in the eccentric strap itself, and in order that each steam valve may have exactly the motion required for its own functions, these rods, though starting from the same block, are made separate and of different lengths. This enables the following condition, which is the gist of the whole, to be obtained. Each bell-crank rock shaft is so placed that when the eccentric is at its full throw in the direction of opening its valve, the arm towards the eccentric is nearly on its center, or in line with the eccentric rod, while the arm connected to the valve stem is nearly vertical, or at right angles to the rod. By this means, it will be seen, a very slight motion of the eccentric produces a very rapid motion of the valve, while, when the eccentric is at the other extremity of its throw, the relative position of the arms of the bell crank being reversed, a very considerable movement of the eccentric produces but little motion in the valve. In other words it remains nearly at rest when closed until the time comes for it to admit the steam, when it rapidly opens a wide port and as rapidly closes it again. The exhaust valve receives a constant motion from the end of the link. The steam valves are placed in a separate chamber from the exhaust, the latter being situated beneath the former. There is a rather large amount of port space involved in this arrangement, but every care is taken to reduce it to a minimum. Equilibrium valves are used for the admission, constructed on a very simple and beautiful principle. The valve is a rectangular frame, like the four sides of a box without top or bottom. Over the back of this is a fixed plate which receives the pressure of the steam and under which the valve just freely slides. This plate is recessed on its under side, and its edges and those of the valve and seat are so situated that when the valve begins to uncover the port it also opens an equal space at each of its sides, top and bottom, thus giving in effect a port four times the length of the valve. The exhaust valve is also constructed so as to open twice its own length of port. The engine at work in the Exposition is running at 200 revolutions per minute, and the diagrams taken from it show a quick and free admission of the steam, giving an initial pressure but little below that in the steam chest (to which an indicator is also applied); a sharp cut-off, an early release, and complete escape of the steam before the returning piston, leaving but half a pound difference of pressure between the cylinder and condenser as measured by the same indicator, and lastly a small amount of compression just sufficient to ease the motion of the reciprocating parts.

The condenser is a part of the engine on which considerable thought has been bestowed. The condensing chamber and hot well, which are side by side, form the upper part of a square casting of which the lower portion is a water chamber forming the air pump. Into this works horizontally a pointed plunger keyed to a prolongation of the piston rod, which by its displacement draws in and forces out a certain quantity of water at each alternate stroke of the piston. The movement of the water produced by this means is as gentle as could be wished at this speed, since it only rises one inch at each stroke and escapes freely at the delivery valves in the bottom of the hot well. The foot valves of the condenser are on the same level as the delivery valves, and open downwards, so that the air entering the air-pump chamber from the condenser remains on the surface of the water and is the first to pass out at the delivery valves, the top of the chamber being slightly inclined to facilitate its escape. This is a very important point, and the proof of it is to be found in the fact that the vacuum obtained remains constantly at 27¼ inches to 27½ inches. To particularize all the points in which the mechanical construction of the engine has been adapted to high speed, would occupy too much of your space. But so carefully has this been done that many who at the first glance exclaimed that such a speed was necessarily too much for any engine, have after a more careful examination of it, confessed that the conclusion was irresistible that an engine could be designed as suitable for that as for a lower speed. In every part the designer has studied to have as few loose pieces as possible. Thus his piston is shrunk on to the rod and held firmly by that means alone. In the smaller sizes the packing consists merely of small grooves turned in the face of the piston, the action of which in preventing the flow of gases is well understood. In the larger engines Ramsbottom's rings are employed, which render all springs or other means of adjustment unnecessary. The crank-pin brass in the connecting rod is held in the solid end of the latter, in which is a wedge of a large bevel, and held by a single good bolt at the top of the rod, and another at the bottom, by means of which it can be set and firmly held at any position, the two bolts locking each other through the intervention of the wedge acting as a deep nut. Great care has also been used in the design of the crosshead to secure lightness, strength, and ample and hard surfaces. The pin is surrounded by a bush of hardened steel, with a square formed on its ends by means of which it is let into the body of the crosshead and prevented from turning. The thorough lubrication of all the parts is another vital point, and has been amply provided for, constant lubrication being in all cases adopted; in the cylinder and valve chest by Ramsbottom's "displacement lubricator" and in other parts by suitable oil cups and wicks. The economy of oil by such means in proportion to the useful effect produced, is sufficiently evident to secure more general attention to its use. I have given this full description of this engine because it unites in itself more features of correct engineering than any other in the Exposition, and moreover being entirely American in design, though English in construction, it is something in which we may take some pride, the more so as the contents of the space allotted to us are not quite such as we should like to have had here to represent the skill of our inventors and machinists. SLADE.

Correspondence.

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

Velocity of Steam.

MESSRS EDITORS—In the SCIENTIFIC AMERICAN of June 8, 1867, on page 359 is the following paragraph:—"Velocity of Steam and other Gases.—Mr. R. D. Napier has demonstrated to his own satisfaction and that of others, first theoretically and afterwards by experiment, that the velocity at which steam will flow from a boiler through an orifice into a vacuum is rather less than half of that given in all published tables, and that it is no greater into a perfect or partial vacuum (at a pressure of two or more atmospheres) than into the air.—the general law is established, that a gas of any given pressure will rush into a gas of not more than half that at the same rate as into a vacuum."

There is an error in this paragraph, either on the part of Mr. Napier or his reporter. It is true that steam flows into a vacuum at only half "the rate" (or half the quantity in a given time) that is given in the published tables; not however because its velocity is less than the old theory assigns to it but because its density is reduced one half in passing the orifice. With this modification the views of Mr Napier as given in the paragraph are correct.

It would be a mistake however, to suppose that Mr. Napier was the first to advance these views. The same views were fully set forth and demonstrated theoretically in an article published in 1848 in the *American Journal of Science and Arts*, second series, Vol. 5, page 78; and the general law of the flow of elastic fluids which is there established theoretically, was afterwards shown to be in almost exact accordance with the results of experiment in another article published in the same work in 1851, Vol. 12, page 186. W.

FACTS ABOUT EXPLOSIONS OF STEAM BOILERS.

If the causes of boiler explosions are ever ascertained so that they may be prevented or at least their destructive effects reduced, the facts and circumstances attending their occurrences must be recorded. For this reason we make room for two communications, the facts contained in which are somewhat commented upon.

MESSRS. EDITORS:—I have perused with much interest your articles on steam boilers, and their explosions, to see if I would find a case of explosion similar to one I once witnessed. The boiler explosion I refer to was in a saw mill belonging to my father in the interior of this state and occurred several years since—in 1857 I believe. There were two 30 in. cylinder boilers, 30 ft. long, enclosed in the usual manner by brick walls. The mill had been running until about 11 o'clock when the engine had been stopped for about ten minutes to sharpen the saw. Steam was blowing off at 60 lbs., making considerable noise, as the safety valve was not inclosed by an escape pipe, when the person in charge of the mill ordered the fireman to hang an old stirrup lying by on the beam. It had not been there more than three minutes when the explosion took place. Both boilers exploded simultaneously, with a report like artillery; it was but a single instantaneous report. One boiler parted about 8 ft. from the front end in the middle of a sound sheet, or an apparently sound one, both ends flying apart, that is neither end flying sideways. The other boiler was torn like wet paper, completely to pieces, or at least in 19 separate pieces, some of them torn across the joint or lap of the sheets, some flattened out nearly straight, others doubled up, but neither head of either boiler, which were of cast iron, was broken or separated from the sheet to which it was fastened. The large or longest end of the first boiler described was blown through the brick chimney, 7 ft. square at the base, from thence taking out all the side posts on one side of a blacksmith shop about 20 yards off, then striking ground a little more elevated ploughing a furrow, its depth of diameter, about 130 yards and there stopping.

I cannot understand how steam, if steam it was, can tear a boiler almost to atoms. I have seen several explosions but none in which such fearful power was shown. The boilers contained sufficient water which was rather strongly impregnated with lime. The boilers were placed at right angles with the mill and about at the centre of the building, outside in a separate boiler house; so placed to guard against danger and destruction in case of explosion, it being supposed that the boilers would almost certainly fly sideways out of their bed. Is that supposition right, generally?

I am using now in a horizontal tubular boiler, water very strongly impregnated with sulphur; will that sulphur injure the iron or how will it affect it? My boiler primes badly; will carrying my steam pipe from the dome on the side from the engine, down the side of the boiler, and under the grate bars, thence upward as high as the dome and to the engine, infringe on anyone's patent for superheating steam, and will it not accomplish the object? W. B. VAN VALKENBURG.

St. Mary's, Ga.

This is undoubtedly a case of genuine explosion, some of the characteristics of which are an entire destruction of a boiler, the ruptures generally taking place in the strongest parts of the boiler, or, in other words, not in the parts where it was riveted, but through the solid sheets.

It is here proper to say that by actual experiment it is found that a single riveted joint loses 44 per cent. of the strength of a plate not riveted.

Now it seems one boiler was torn through a solid sheet and not in the line of rivets. If the rupture had been caused by a gradual accumulation of pressure it would undoubtedly have given way in the weakest part along the line of rivets, being there but about half the strength of the solid plate. The other boiler, its mate, it seems was thrown into a large number of pieces—rents at random—and all with the safety valve open!

The inevitable conclusion is that there must have been an instantaneous increase of pressure, so instantaneous as not to give the safety valve time to open more to relieve the boilers; in fact the entire destruction of one boiler was not sufficient relief to save the other!

The direction that the two pieces of the boiler took was that due to the force that propelled them. Under the circumstances the boilers could not have gone sideways. Had a rupture taken place on the side, the boilers would have been propelled in the opposite direction; if on the bottom the boiler would have gone up.

This is a very rare case. A prominent engineer with an experience of over 40 years with steam boilers has seen but three cases of the kind; the cause for these terrific explosions is not yet understood.

The sulphur in your water will, without doubt, cause your boiler to prime. You will be relieved of your priming by suspending a platform of wood or metal, at the water line directly under the point where your steam is taken off. Let it be of sufficient size (square) to fill the space at the water line. You will cool rather than superheat your steam by the method you propose of conducting your steam down the side of the boiler and under the grate bars.

MESSRS. EDITORS:—Your correspondent G. W. D., of Providence, R. I., was not correct in the statement of the cause of the boiler explosion that lately took place in Massachusetts, as given in your paper No. 23, Vol. XVI, page 358. The superintendent has never attributed the cause to an excess of water or yet to any known cause. The boilers were plain cylinder boilers, 36 ft. long 30 in. diameter, and carrying the usual amount of steam at the time of the explosion—"about 80 lbs." They were fed at the rear end, water being pumped through a tank into them, the pipes so arranged that the check valves could hardly be said to be nearer one boiler than another; the boilers were placed in two sections, four in each. The coal used was pea and dust mixed, consequently the fires had to be cleaned out at least once a day. At the time of the explosion the fires were about to be cleaned, having some six or eight inches of dead ashes on the grate bars, with two or three inches of fire on that, which was low in order to clean them out, usually done by pushing back the fire to the bridge wall, then drawing out the ashes, pulling the fire down on the grate bars, and adding fresh coal. Just before cleaning the boilers were always filled with water. The fireman had just stopped the pump as the agent of the mill came into the room, and trying the gages of each boiler himself and finding a full gage at the upper cock, he cautioned the firemen not to fill the boilers too full as he thought it not good economy in making steam. He went directly to the office and had hardly seated himself when the explosion took place. One of the center boilers was broken about six feet from the end, or the length of two sheets from the head of the rear end, parting in the rivet holes. The short end of the boiler lodged in the chimney, the other was thrown some 800 feet from its bed, almost in a direct line; the one next to it was lifted up and thrown over the other two outside of the building. All of them seem to have been lifted up as from a pressure below; the walls were leveled even with the ground, scarcely one brick left upon another, and even below the ground the flues leading to the chimney were more or less shattered. The explosion took place at once upon stopping the blower. There was heard a sound as of a heavy rush of air, as described by those working in a building near by. One hearing this sound jumped from his chair and reached the centre of the room before hearing the report of the explosion.

Now, Messrs. Editors, what was the cause of the explosion? Was the space under the boilers charged with gas, a space perhaps, 20 ft. long, 3 ft. deep, and of the width of each section? Some have thought so. The fireman has since said his furnace doors have sometimes sprung open and the smell of gas was quite strong, particularly when the blower was being used, or the fires buried at night, at which time the damper was nearly closed. I think no argument would convince the agent of the mills that the cause was absence of water, after trying them himself. Could a boiler foam out its water in ten minutes, or less than that time, with such low fires as were burning at the time of the explosion?

Hebron Mills, Mass. C. T. CARPENTER.

[The above was probably not technically an explosion, but the giving out of the part under a gradually accumulated

pressure. If all the facts were known, it undoubtedly would be found that the joint where it gave out was a forced one, or in other words, when the boiler was made, the parts did not fit, and were hammered cold to make the one larger and the other smaller, and then to make the rivet holes correspond; the drift pin was freely used—all tending to disintegrate, crack, and destroy the strength of the plates—a most vicious practice.

The supposition that gas externally had any thing to do with the rupture of the boiler, or the destruction caused by it, is absurd; the large quantity of water suddenly liberated at a temperature of over 315°, together with the explosion of the steam, which would be instantly made on liberating the pressure—to this add the steam contained in the boiler, which would expand about 4.7 times—and we need search no farther for the cause of the destruction, lifting boilers, etc.

With regard to the boiler "foaming out" its water in ten minutes. This would be impossible, and to keep the engine running, inasmuch as there was say 120 cubic feet of water in the boiler and to put that through the engine in ten minutes would probably knock it to pieces.

This occurrence will very naturally create a distrust of the remaining boilers. They should be tested by the hydraulic test to a pressure 30 per cent higher than the steam pressure required, and the steam gage should be examined to see if it is perfectly correct.—EDS. SCI. AM.

[For the Scientific American.]

THE SAMPSON SCALE.

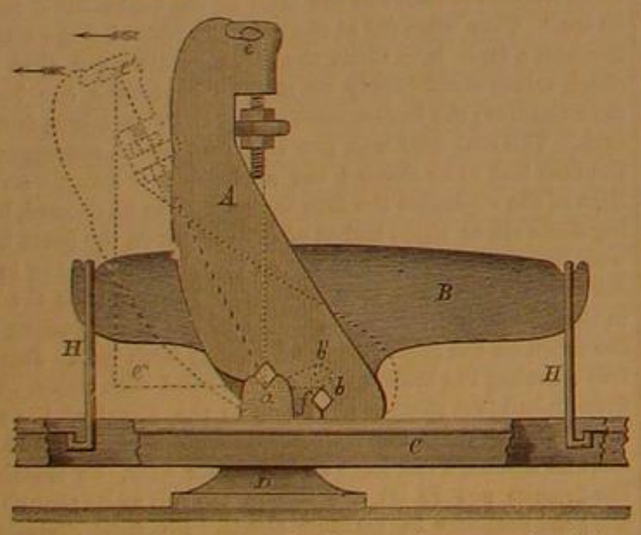
[Entered according to act of Congress, in the year 1867, by M. Richard Leverson, in the Clerk's office of the U. S. District Court for the Southern District of New York.]

A novel and interesting application of the mechanical laws of moments is to be seen in the Sampson Scale, in which the inventor, probably without knowing it, has afforded a beautiful illustration of those laws, and has produced a scale of unequaled delicacy and which(equal workmanship being assumed) not merely is, but demonstrably must be more sensitive than any platform scale yet invented.

Our readers will no doubt remember that the moment of a force with respect to a point is the product obtained by multiplying the intensity of the force by the perpendicular distance from the point or center of moments to the line of direction of the force. This perpendicular direction is called the lever arm of the force, and the moment itself measures the tendency of the force to produce rotation about the center of moments.

The moment of a force with respect to an axis of moments is equal to the moment of the projection of the force upon a plane at right angles to the axis taken with respect to the point in which this axis pierces the plane as a center of moments.

These are the only principles involved in the Sampson scale to which attention need be called, their application being novel, remarkably simple, and beautiful from their simplicity, as will be seen from the following explanation



The top yoke, B, carrying the frame or bottom yoke, C, hung from it by the links, H, rests upon a knife edge, b, between the ear-shaped connected arms or uprights, A, which rest by their knife edge, a, on D. A chain connects by another knife edge at c, and according to the capacity for which the scale is designed connects either by a bell crank directly with the short arm of the steelyard, or with that short arm through other levers constructed on the same principle with the first, until the desired multiple of the scale weight is obtained.

In a scale capable of weighing 20,000 pounds, the first lever was in the proportion of six to one, a second was in the proportion of three to one, and a third in the proportion of six to one, while the steelyard was in the proportion of a little more than six to one—so that three pounds at the extremity of the long-arm of the steelyard should balance 2,000 pounds upon the platform.

The platform rests upon four carriages, C, one at each corner of the floor. The weight W, resting upon the platform; it is obvious that a is an axis of moments, with respect to the weights, W, and with respect to the weight, P, which rests on the steelyard, and which two weights are in effect two forces tending to turn the rigid body, A, round the axis a, in opposite directions. The weight, P, is a force, P, applied in a horizontal direction at e, and the weight, W, is a force, W, applied in a vertical diretion at b, and it is by making the angle, eab, a right angle, that the extreme delicacy of the scale is secured, while the shortness of the lever arms, ab, ae, frees the scale from the *spring*, which is the chief source of error in almost all the ordinary descriptions of scale, absolutely unavoidable when a long lever arm is employed.

So long as the moments of P and W, with respect to the axis of moments, a, bear the same proportion to one another, so long is the utmost sensitiveness insured. When P and W are ballanced, $P \times ae = W \times ab$, but suppose $P \times ae$ is unequal to $W \times ab$, and let $\frac{P \times ae}{W \times ab} = Q$ be greater than 1, then P will pull the scale over (raising the weight, W.) into, say, the direction indicated by the dotted lines, ae' ab'.

The moment of the horizontal force, P, tending to revolve the body, A, about the axis, a, in one direction is $P \times e'e'' = P\ ae'$ cos. $ae'e'' = P\ ae$ cos. eae', and the moment of W tending to revolve the body, A, in the opposite dirsetion about a is $= W \times af = W\ ab'$ cos. $b'af = W \times ab$ cos. $e'ae$ ($e'ab'$ being a right angle and the angle $b'af$ therefore equal to the angle $e'ae$.)

Then the ratio of the moments of P and W, when the body has been drawn to the position indicated by the dotted lines is $\frac{P \times ae \text{ cos. } eae'}{W \times ab \text{ cos. } eae'} = Q$ as before.

But if the knife edges had been otherwise disposed these ratios would have varied with every change in position of the rigid body A.

Suppose the angle $e'ab'$ or eab not to be a right angle, then the moment of P with respect to the axis, a, would have been $= P \times ae$, cos. of the angle which ae makes with the axis of y. Call this angle Y, and the moment of W with respect to the same axis, a, would be $W \times ab \times$ cos of the angle which ab makes with the axis of x. Call this angle X, and the ratio will be $\frac{P\ ae \text{ cos } Y}{W\ ab \text{ cos } X}$

Let the body A be drawn over say by P, as before. Then the angles made by the lever arms of P and W with the axes of x and y respectively are increased by the same quantity, v, and the moments of P and W become respectively $P \times ae$ cos $(Y+v)$ and W ab cos $(X+v)$, but

$\frac{P \times ae \text{ cos } (Y+v)}{W\ ab \text{ cos } (X+v)}$ is unequal to $\frac{P \times ae \text{ cos } Y}{W \times ab \text{ cos } X}$

except when $v=0$ or some multiple of 90°. Hence it is that a scale constructed without the very strictest regard to placing the knife edges at the angles of a right angled triangle must be deficient in sensitiveness.

The platform of the Sampson scale rests at its four corners on four carriages, C, which ,swinging feeely by the links H, keep the platform perfectly horizontal and preserve it from rubbing or jamming against the frame. The entire floor covered by the scale constructed to weigh 20,000 lbs. is only 15 feet by 10 feet 3 inches, and so far as its weighing properties are concerned the scale could easily have been built in one fourth or even one sixteenth the space.

The following experiments conducted in our presence show the beautiful results obtained by attention to the simple laws above mentioned, combined undoubtedly with skillful workmanship.

A weight of 4,000 lbs. being placed upon the platform and exactly balanced by a weight of 6 lbs. at the extremity of the steelyard, the addition of half a pound only on the platform caused the steelyard to strike the upper stop. The scale was then balaneed by adjusting the index weight to the half-pound point upon the steelyard and the half-pound weight then removed from the platform, when the steelyard fell and rested on the lower stop.

After exhibiting the deflection caused by the addition or subtraction of a half-pound weight on the scale while 4,000 lbs. were on the platform, the weights were heaped up first on one corner of the platform and then indifferently on different parts of the platform without the slightest deviation in the result or straining of the parts.

A scale constructed on this principle is in use at the weigh lock at Waterford, on the Champlain Canal and elsewhere, and has been very favorably reported on by the State Engineer and Surveyor in his report for 1862, but no explanation of the principle on which its remarkable delicacy depends has, we believe, ever before been given to the public.

The 20,000 lbs. scale referred to above is, we believe, to be seen at the company's office, No. 240 Broadway.

M. RICHARD LEVERSON.

New Mode of Operating Hay Forks.

A very simple and useful contrivance for unloading hay from the cart and depositing the same at any desired part of the barn, has been recently invented by D. L. Miller of Madison N. J. He uses a clutch pulley through which a rope is extended horizontally from one portion of the barn to another near the roof. To the pulley is another rope extending vertically from the way rope to which the fork is attached. It will be understood how easily with such an arrangement one man can unload and deposit in any part of the barn. The invention consists in the arrangement of rigging, it being adapted to the use of the well known large forks.

Blue Coloring Matter.

M C. A. Girard, of Paris, has patented improvements in the manufacture of blue coloring matter. He introduces into a distilling apparatus two parts of commercial diphenylamine and three parts of sesquichloride of carbon, and heats the mixture, taking care to maintain the temperature between 170 deg. and 190 deg. Centigrade. The blue color is rapidly developed, and in five or six hours the mass assumes a bronze aspect and becomes brittle on cooling. The melt with the bronze aspect is powdered and treated until complete exhaustion in a displacement apparatus with benzole or ether at a gentle heat. In this apparatus the warm solvent filters through the powdered melt and is afterward distilled, the vapor is condensed and returned on to the melt, and so on continually. The untransformed sesquichloride of carbon and commercial diphenylamine are dissolved as well as a small quantity of bluish violet; the greater part and the best part of the blue remains undissolved. The blue is then collected and dried, and may, after being dissolved in alcohol or methylated spirit, be at once employed in dyeing or printing; but, if it be desired to purify it further it may be dissolved in boiling alcohol, filtered and precipitated from the filtered solution by hydrochloric acid. The inventor has observed that pure ditolylamine yields under the same conditions a brown coloring matter; pure diphenylamine yields a blackish violet blue; and penyltolylamine a bluish violet or violet blue; but a mixture of diphenylamine and ditolylamine and of diphenylamine and phenyltolylamine in any proportions yields a blue. He, however, remarks that some proportions are better than others, and that two parts of diphenylamine and one part of ditolylamine are good proportions.

NEW PUBLICATIONS.

APPLETON'S HAND BOOK OF AMERICAN TRAVEL.—THE NORTHERN TOUR. By Edward H. Hall. D. Appleton & Co., 443 Broadway, New York City.

Beginning with sensible and plain advice to travelers, as applicable to foreigners as our own people, this volume presents all the information required for a tour from Nova Scotia to California, including all the Eastern, Middle, and Western States and the Canadas. Plain directions as to railway and steamboat lines, hotels, objects of interest, and brief descriptions of places, without annoying and wearying with useless trash, give a peculiar value to this book, which some other more pretentious volumes do not possess. Maps of the country and plans of the cities through which the tourist may pass are bound in the book, and will be found to be a great convenience.

BRADSHAW'S HAND BOOK TO THE PARIS EXPOSITION, London. J. Wiley & Son, 535 Broadway, New York City.

This volume contains an alphabetical index of the classes of articles in the Exposition, with all the instruction necessary to visitors relative to the plan of the building, its approaches, prices of admission, and brief and comprehensive details of the general features of this great world show, with a fine map of Paris and its environs. It is timely and interesting, whether the reader is a visitor or only a home seeker for knowledge.

HISTORY OF THE ATLANTIC TELEGRAPH. By Henry M. Field. Second Edition. Charles Scribner & Co., 654 Broadway, New York City.

To any one who cares to read the record of a successful undertaking which puts to shame the wildest imaginings of romancists; who desires to know what human energy and determination can accomplish against the adverse operations and the almost insuperable obstacles of nature, we commend this volume. It seems, even in the details of the enterprise, like the fabulous and incredible statements of ancient story tellers, yet the result is apprehended every day by the people on both sides the Atlantic. The facts about the great submarine telegraph, although appearing occasionally in newspaper paragraphs, have never been so clearly stated as in this volume. We shall draw from them hereafter. Meanwhile we recommend the perusal of this book to all who believe in the ultimate sovereignty of man over nature. They cannot fail to be deeply interested.

KELLOGG'S UNITED STATES MERCANTILE REGISTER FOR 1867–8. Kellogg, Johnston, & Co., 116 Nassau street, New York City.

This work is a compendium of information of inestimable value to every business man. It is divided into two parts, the first including an amount and variety of useful information which otherwise must be sought in ponderous and numerous volumes. The internal revenue laws, including licenses and stamps; the tariff; weights and measures of all nations; general statistics of the country; value of foreign coins; the United States bankrupt law; mercantile laws of all the states; domestic and foreign postage; list of post-offices and telegraph stations, and many other convenient items of information are contained in part first. Part second is a business directory of all the principal cities of the Union, alphabetically arranged and handy for reference.

TROW'S NEW YORK CITY DIRECTORY. Compiled by H. Wilson, for the year ending May 1, 1868. John F. Trow, 52 Greene street, New York City.

This is one of the books, which, like the dictionary, contain only hard facts, and is of immense value to the business man, the resident, and the stranger. The compiler in his preface says: "It has required almost a half century of constant effort and unremitting practice to bring the complicated organization of forces into perfect working order which are necessary to the annual production of this work. But as the magnitude of the Directory has increased, its defects, we believe, have decreased." This issue contains 177,317 names.

PRINCIPLES OF MECHANISM AND MACHINERY OF TRANSMISSION. By Wm. Fairbairn, Esq., C. E. Henry Carey Baird, 406 Walnut street, Philadelphia.

This volume is a synopsis or abridgement of the author's large work on "Mills and Millwork," and is better adapted to the wants of American millwrights, machinists, and operatives than the former. It contains, in the "Principle of Mechanism," descriptions of most of the general combinations of machinery, with plans, formulas, and explanations, and the chapters devoted to "Machinery of Transmission" give details of all the different varieties of pulleys, gears, screws, clutches, etc., with a treatise on shafting It is illustrated with engravings, diagrams, and plans, and has a copious index.

THE AMERICAN ANNUAL CYCLOPEDIA and Register of Important Events of the year 1866, Embracing Political, Civil, Military, and Social Affairs; Public Documents; Biography, Statistics, Commerce, Finance, Literature, Science, Agriculture, and Mechanical Industry. Volume VI. pp. 800, 8vo. New York. D. Appleton & Co.

This important and elaborate Annual makes its appearance with its usual characteristics, which are well summed up on the title page as quoted above. A record of one of the memorable years of the world's history, it could hardly escape a plethora of matter more fascinating and marvelous than fiction, and such as every intelligent person wishes to have embodied, indexed and at hand for ready reference in the future. It is appropriately garnished with a portrait of the central political figure of the year, Count Bismarck, and also with the attendant figure of King William I, of Prussia, and with that of Garibaldi as a background.

CHEMICAL NEWS—REPRINT.

We are glad to learn that W. A. Townsend & Adams, Publishers, of this city, have undertaken the republication of the *London Chemical News*. This is one of our best foreign publications, but the high price which it has cost subscribers in this country, has prevented a large circulation. The reprint will be afforded so cheap that the publication must have a large circulation. A prospectus giving full particulars may be found in our advertising columns.

THE CORRELATION AND CONSERVATION OF GRAVITATION AND HEAT, AND SOME OF THE EFFECTS OF THESE FORCES ON THE SOLAR SYSTEM. By Ethan S. Chapin. Springfield, Mass. Lewis J. Powers & Brother. pp. 120.

The writer of this book is evidently an independent and fearless thinker. He does not hesitate to disagree with doctrines which have stood for centuries. The book is speculative, and treats of the most exalted subjects.

RAILWAYS IN ITALY.—By the transfer of Venetia to the kingdom of Italy, the network of Italian railways has been increased to the extent of 600 miles. An uninterrupted line of railway has now been established on the eastern side of the Italian Peninsula. The opening of the line from Ancona to Foligno and Rome, puts the north in communication with Naples. Florence has now also uninterrupted railway communication with Rome.

Improvement in Straw and Hay Cutters.

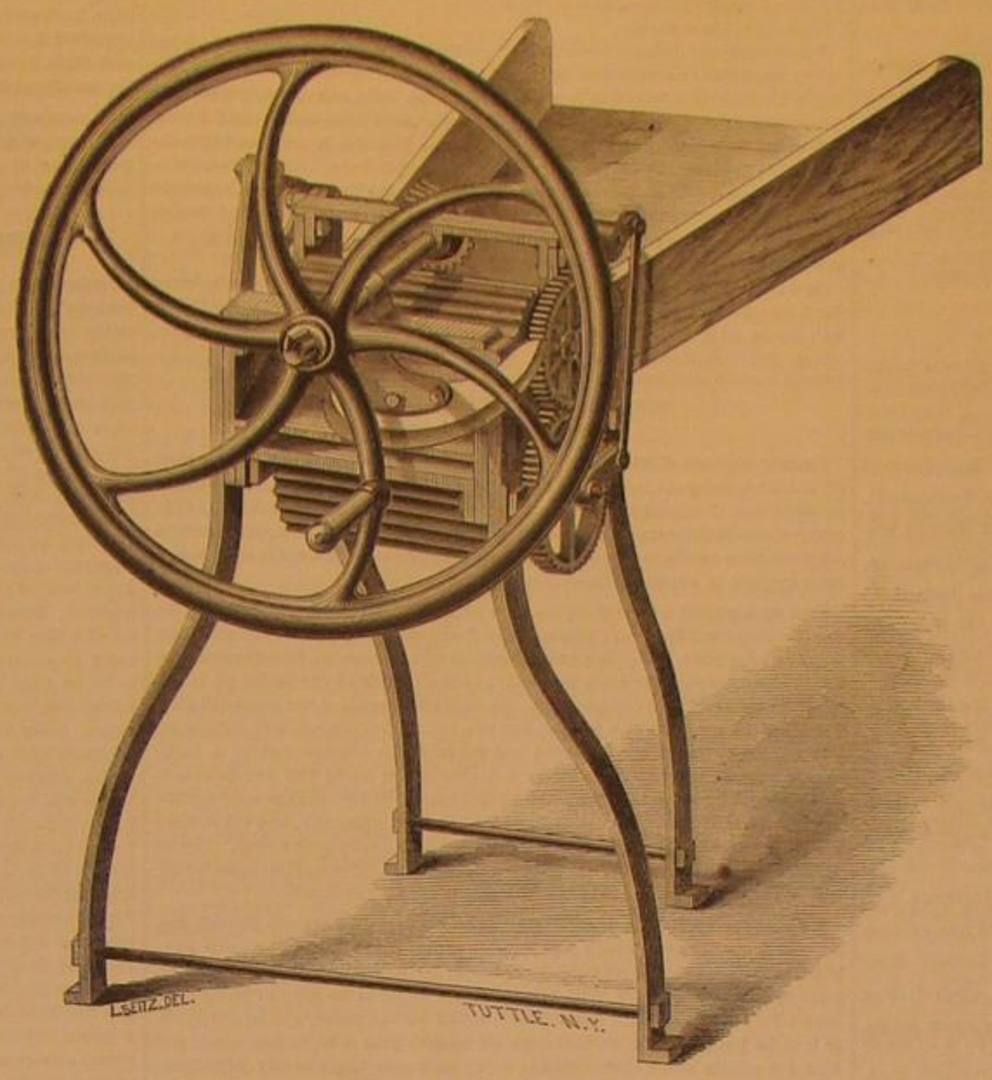
The intention of the inventor of this machine is to construct a hay and straw cutter which *cuts* rather than squeezes off the fibers. Cutting is usually, when the process is properly performed, a combination of pressure and a drawing motion. If the first is used alone the labor is much increased, and if the latter alone the material glides away from the cutting edge. In the machine shown in the engraving both these elements are combined in such a degree that they produce the best results.

In its general appearance the machine does not differ greatly from those ordinarily in use, but in its details it is entirely different. The machine shown in the engraving has the fly wheel and crank in the front, but it may be so modified as to place the crank, as usual, at the side, on the shaft seen running across the machine. On the central shaft is a curved knife forming a segment of a circle, the edge of which is an eccentric relative to the shaft, and thus has a drawing action.

The shaft carrying the fly wheel and crank has at its other end a bevel gear engaging with a similar gear on the transverse shaft, on one end of which is a crank that turns the feed roller—the one seen in the engraving—and the other end of which has a cam that engages with a lever which depresses a jointed plate that presses the hay or straw closely against the lower side of the mouth of the trough, ready for the action of the knife. The motions of the cam, lever, and knife are coincident, so that while the knife is in action on the hay the plate presses it closely together.

Connected with the lower or feed roller by gears, seen at the side of the machine, is an upper roller intended to reduce the friction of feeding the straw or hay to the knife. It is evidently a combination in accordance with correct principles in mechanics, and well adapted to the cutting of feed, etc.

It was patented Aug. 14, 1866, by Heinrich Gottfried. The whole right, or rights for States are for sale. For further information interested parties are referred to Mr. Gottfried, care of Joseph Peter, 241 Bowery, New York city, where a machine can be seen in operation.



GOTTFRIED'S IMPROVED HAY CUTTER.

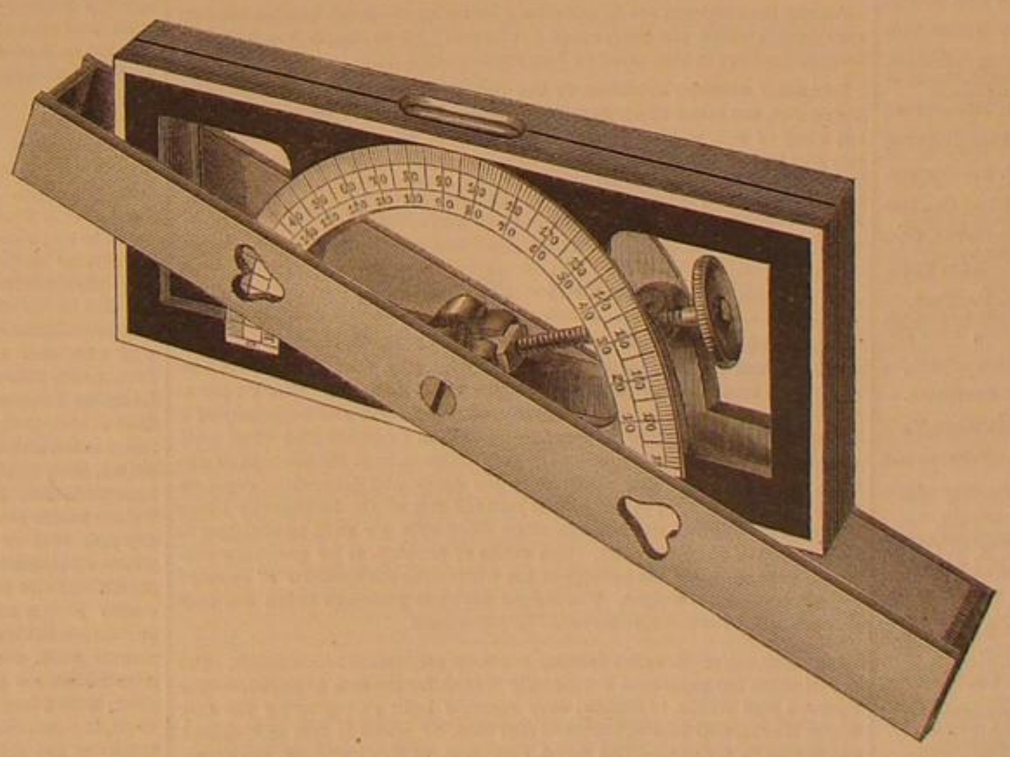
Combined Level, Square and Bevel.

The instrument herewith represented is intended to supersede a number of separate tools used in the shop of the mechanic. It is used as a spirit level, try-square, clinometer, bevel protractor, etc., and is suitable for the machinist, wood worker, draftsman, and surveyor.

As will be seen, it is a rectangular metallic frame or box on the sides of which are secured graded semicircles. In the top is seated the tube of a spirit level. Pivoted at the center near the bottom is a steel frame with heart-shaped apertures in its sides to permit the figures on the scale to be seen when the frame is set at any angle. A thumb-screw with a sliding block secures the pivoted frame in any position desired. The whole instrument is capable of being carried in the pocket—and being wholly of metal—steel and brass—will not be easily broken.

The machinist will find it handy in finishing up six-square nuts, in setting the planer head to cut bevels, and in various other operations. The pattern maker can record the angles of his work by its means so that the finisher can work exact to the original design or pattern. The carpenter and joiner can employ it in laying out his work and also in fitting it. It is also a handy article for the use of engineers, surveyors, and others who may be employed in running lines or locating claims.

It was patented through the Scientific American Patent Agency by G. L. Chamberlin, January 1st, 1867. For further information address Warden and Batchelder, Corner Duquesne and Irwin streets, Pittsburgh, Pa.



CHAMBERLIN'S COMBINATION LEVEL.

The Mechanical "Ignis Fatuus."

One of our correspondents who believes in studying nature rather than in trying to violate her laws with impunity, writes thus:—

You very properly decline discussing the cause of failure of each and every attempt at producing a self-moving machine, or one capable of generating power at least equal to the friction among its parts and through the atmosphere. Will the fundamental laws of *vis inertiæ* never be recognized and understood? Until the principle of vitality is imparted to matter, what is the use of attempting to persuade it to move itself? I have had occasion to examine several of these contrivances, some of them very complicated and ingeniously put together, but I have never found any difficulty in showing that the same power applied directly would produce a greater effect, without the aid of the power-gaining machinery than with it. It is to be hoped the rising generation may be so grounded in the inherent laws of nature as to work in accord with, and not against them.

W. J. B.

Gummy Leather.

The Hide and Leather Interest explains the prevalence of gummy leather by the substitution of fish for neats-foot oil. "In the earlier days, the oil used in the finishing of leather was neats-foot only (we believe such is the case with English tanned leather still); then we heard nothing of gummy leather; but as time rolled on and neats-foot oil grew dearer, leather dressers sought out some cheaper substitute, and the article nearest neats-foot oil was supposed to be the oil expressed from fish. The hide of the cow or the calf has a strong affinity for neats-foot oil, of course; even the hide of the horse absorbs this oil, and holds it. This oil does not gum, and will not, when once absorbed by the leather, exude to the surface. Not so with fish oil, however. This is something of quite another character. The oil of the fish dffers as much chemically from the oil of the hoof of the ox or the cow as it does from that obtained from the vegetable world, which contains a still larger amount of gummy property. Fish oils are heating or burning in their character, and will ruin any leather they are applied to; the stock hardens, and finally cracks, through the effects of the stuffing of which this oil is the main ingredient. If fish oil and neats-foot oil are mixed, the evil is lessened: and when tallow is incorporated, the bad results of the fish oils are partially warded off; but the application of fish oil to leather kills the substance, and is the prime cause of the gum found on the surface.

The Whitworth--American Engine.

This notable feature of the Paris Exposition, of which our foreign correspondence gives a full description, is the subject of the following remarks in *Engineering*: "The engine, however, in the English department which is most deserving our attention is one which steps far beyond any other steam engine in the Exhibition in its character and purpose. It is derived from Corliss': it is improved by two Americans, Allen and Porter, and it is constructed with the forethought, proportion, symmetry, and truth of construction which have so long distinguished all that issues from the establishment of Whitworth, of Manchester.

Having overtaken Mr. Corliss in the application of the steam in his cylinder, the constructors of this engine now make a great stride to go beyond him. They say, "Our valves are not only as good as 'Corliss', but they are, withal, so smooth and gentle in their action that they are capable of working much more rapidly." They have therefore determined to use this smoothness of action for the development of a far higher amount of power out of an engine of given size than had heretofore been accomplished. Corliss' engine, like other fixed steam-engines, performs admirably with a piston traveling, say, 200 feet a minute, or about the usual traditional speed of the steam engine. The Allen-Porter-Whitworth engine leaves this behind with a long stride: its piston starts away at the usual speed of 800 feet per minute, and in doing so quadruples the work done by an engine of given size and power. This is certainly an unparalled feat in the gymnastics of the steam engine, and, if successfully accomplished, seems to promise an important revolution in machinery.

It is not to be overlooked that we are speaking of a condensing-engine, and, what is more surprising still, an engine whose air-pump works with the same speed as its steam piston. The eye scarcely can see the plunger of the air-pump clearly, from the rapidity with which it travels in and out of the condenser. The plunger looks more like the elongated shot of a Whitworth cannon than the piston of an air pump: in shape, it is truly an elongated steel or iron shot, which strikes the water in the air-pump with such velocity that if the point of the plunger were not sharpened into a parabolic curve its stroke on the water would shatter the condenser to pieces. As it is constructed, however, by means of ingenious hydraulic mechanism, the rapid stroke of the air-pump is converted into so gentle a rise and fall of the water that the valves work with scarcely a sound, and a gentle throb when your hand is laid on the condenser is all that tells you of the pulsation going on within. The engine is a marvel of ingenuity and design.

Rapidity of Organic Growth.

As atoms are commonly distinguished as the elementary units of inorganic matter, so cells form the ultimate sub-divisions of organic structure, and by their increase in size and multiplication in number, all vegetable growth is produced. The size of these cells varies from about the thirtieth to the thousandth of an inch in diameter. An ordinary size is from $\frac{1}{300}$ to $\frac{1}{500}$ of an inch; so that there may generally be from 27 to 125 millions of cells contained in one cubic inch Remembering that many stems shoot up at the rate of an inch or two, or sometimes three or four inches a day, we may form some idea of the rapidity of their formation. The giant puff-ball has been known to enlarge from an inch to nearly a foot in diameter, in a single night. A still more remarkable example is the huge flowering stem of the century-plant. After accumulating its energies for so many years, it at last sends up a flowering stalk which grows at the rate of twelve inches per day, until about six inches in diameter. Supposing these cells to average $\frac{1}{400}$ of an inch in diameter, nearly one thousand millions of cells are consequently formed every hour.

French Washing Machinery.

The soiled linen of the Grand Hôtel, the Hôtel du Louvre, the Grand Café, and of a few of the other hotels and cafés in Paris, is washed at the rate of 40,000 pieces a day, at the Blanchisserie de Courceiles, three miles or so from the St. Lazare terminus of the Western Railway The linen is boiled with soap and soda and then washed in hollow wheels, rinsed, partly dried by centrifugal machines, and for the rest in hot-air ovens, which carry off nealy three pounds of moisture per pound of coal burnt, and is finally ironed between polished rollers, and then packed ready for return to Paris.

Mechanics' Exhibition at the Maryland Institute.

The twentieth annual exhibition of American manufactures under the direction of the Maryland Institute, will be held in Baltimore, Md., from the 15th of October to the 12th of November, 1867. The building was constructed expressly for such exhibitions, and is unequalled in the country for the purpose. Manufacturers, mechanics, and inventors throughout the country are requested to contribute. Premiums will be offered and steam power will be furnished gratuitously for machinery. All informatien desired in regard to the exhibition may be obtained on addressing J. H. Tubker, Esq., Baltimore, Md.

A NOVEL PRINCIPLE of compensation to victims of railway accidents is advocated by the English Railway Commission. They think the amount of compensation to be paid by the Company in fault should be limited to some established multiple of the rate of fare per mile paid by the sufferer: say £100 to the penny for capital cases; but that any passenger may require the Company to insure him to any additional amount by paying in proportion.

THE PARIS EXPOSITION—OFFICIAL LIST OF THE AWARDS TO AMERICAN EXHIBITORS.

The following is an official list of awards to Americans by the committees of the Grand Exposition, as sent by the Atlantic Telegraph. Of course it may be expected that some errors have occurred in its transmission. The names are given in the order in which the report will be made.

GRAND PRIZES.

M. Chapin, Lawrence, Mass—Well-conducted Factory.
Prof. Hughes, Kentucky—Printing Telegraph.
Cyrus W. Field, N. Y.—Promoter of the System of Ocean Telegraphy.
Dr. F. W. Evans, Paris—Sanitary Collection.

GOLD MEDALS.

Steinway & Sons, N. Y.—Pianos.
Chickering & Sons, N. Y. and Boston—Pianos.
S. S. White, Philadelphia—Artificial Teeth, etc.
H. D. Walbridge, N. Y.—Minerals from Idaho.
J. P. Whitney, Boston—Minerals from Colerado.
Louis Trager, Concordia Parish, La.—Cotton.
Victor Meyer, Concordia Parish, La.—Cotton.
C. H. McCormick, Chicago—Mowing Machines.
W. A. Wood, Hoosick Falls, N. Y.—Mowing Machines.
Corliss Steam Engine Co., Providence, R. I.—Steam Engine.
William Sellers & Co., Philadelphia—Machine Tools.
Wheeler & Wilson, N. Y.—Sewing Machines.
Elias Howe, N. Y.—Inventor of Sewing Machines.
C. B. Rogers & Co., Norwich, Conn.—Wood-Working Machinery.
Patrick Welch, N. Y.—Type Dressing Machine.
Locomotive Works, Paterson, N. J.—Locomotive Steam Engine.

SILVER MEDALS.

Fred. E. Church, N. Y.—Oil Painting.
L. M. Rutherford, N. Y.—Photographs.
Mason & Hamlin, N. Y.—Organs.
J. K. Barnes, Surgeon-General, U. S. A.—Military Surgical Apparatus.
S. D. Tillman, N. Y.—Tonsometer.
Mrs. Rich'd F. Bond, Boston—Astronomical Instruments and Chronometers.
B. B. Tolles, Canastota, N. Y.—Microscope and Telescope Glasses, Eye-pieces and Telescope.
Wm. Wales, Fort Lee, N. J.—Microscope Object Glasses.
J. R. Brown & Sharpe, Providence, R. I.—Measures, Gages, etc.
Tinker Man. Co., N. Y.—Bronzes.
New York Mills, N. Y.—Fine Muslins.
Clark Thread Co., Newark, N. J.—Thread.
S. Fournier, New Orleans.—Regulating Telltale Clocks, etc.
Webster Woolen Mills, Webster, Mass.—Woolen and Cotton Fabrics and Jaconets, etc.
J. L. Hays, Boston.—Series of Woolen Fabrics.
E. C. Burt, N. Y.—Machine Sewed Boots and Shoes.
Colt's Patent Arms Man. Co. Hartford, Ct.—Colt's Fire Arms.
E. Remington & Sons, Illion, N. Y.—Military and Sporting Fire Arms.
Smith & Wesson, Springfield, Mass.—Fire Arms and Metallic Cartridges.
Windsor Man. Co. Windsor, Vt.—Fire Arms.
Spencer Rifle Co. Boston.—Spencer Rifles.
Douglas Ax Co. Boston—Axes, etc.
J. B. Taft, Chester, Mass.—Emery stone.
State of Illinois—Cereals.
J. B. Pioque, San Francisco.—Collection of California Minerals.
Prof. W. P. Blake, San Francisco, Cal.—Minerals.
Bigelow & Co., Boston.—Coffee.
Park Brothers & Co., Pittsburgh, Pa.—Edge Tools.
F. S. Pease, Buffalo, N. Y.—Oils.
Grafton & Co., Louisiana—Cotton.
A. Delpit & Co., New Orleans.—Tobacco.
G. J. Wardwell, Poultney, Vt.—Stone Channeling and Quarrying Machine.
Collins & Co., N. Y.—Plows.
Shultz & Warker, N. Y.—Soda-water Fountains.
Fairbanks & Co., N. Y.—Standard Scales.
J. R. Browne & Sharpe, Providence, R. I.—Revolving Head-screw Machine and Universal Milling Machine.
Bement & Dougherty, Philadelphia, Pa.—Machine tools.
Cool, Sherman & Co., Glen Falls, N. Y.—Barrel Machine.
I. W. Lamb, Rochester, N. Y.—Knitting Machine.
M. Opper, N. Y.—Corset Loom.
George Crompton, Worcester, Mass.—Crompton Loom.
American Button-hole Co., Philadelphia.—Button-hole Machine.
Weed Sewing machine Co., N. Y.—Sewing machines.
Florence Sewing-machine Co., N. Y.—Sewing machines.
Baxter D. Whitney, Winchendon, Mass.—Wood-working machines.
Wood Brothers, N. Y.—Phæton.
James Hall & Son, Boston.—Buggy.
Isaac Gregg, Philadelphia—Brick Machine.
Yale and Winn Manufacturing Co., Shelburne Falls, Mass.—Locks.
Chapin & Wells, Chicago—Swing Bridge.
Board of Public Works, Chicago—Plan of the Chicago Tunnel.
J. A. Robinson, N. Y.—Daboll Fog Trumpet.
Culbertson & Co., Chicago—Salt Meats.
Glencove Starch Co., N. Y.—Starch and Maizena.
C. Duffield, Chicago—American Westphalia Hams.
Cope, Culver & Co., N. Y.—Manhattan Hams.
W. Baker & Co., Dorchester, Mass.—Chocolate.
G. S. Lawrence, Louisiana—Sugar.
Dr. S. G. Howe, Boston—Books for the Blind.

BRONZE MEDALS.

D. Appleton & Co., N. Y—Books.
Houghton & Co., Riverside, Cambridge Mass—Books.
G. & C. Merriam, Springfield, Mass—Webster's Dictionary.
Automatic Boiler Feeder Co., Philadelphia—Boiler Feeder.
Jessup & Moore, Philadelphia—Paper.
W. F. Murphy & Sons, Philadelphia—Blank Books.
American Lead Pencil Co., N. Y.—Lead Pencils.
A. G. Day, Seymour, Conn.—Invisible Lead Pencils.
Secombe Man'f'ng Co., N. Y.—Ribbon Hand stamp.
L. W. Fairchild & Co., N. Y.—Gold Pens.
Sigismund Beer, N. Y.—Stereoscopes.
Geo. Gemunder, N. Y.—Violins.
Schreiber Cornet Man. Co., N. Y—Brass Instruments.
E. D. Hudson, N. Y.—Artificial Limbs.
Johnson & Lund, Philadelphia—Artificial Teeth.
Cummings & Sons, ——, Hospital Car.
C. Abbey & Sons, Philadelphia—Gold Leaf for filling teeth.
Milton Barlow, Midway, Ky—Planetarium.
A. J. Johnson, N. Y.—Family Atlas.
J. B. Lyon & Co., Pittsburgh—Glassware.
W. H. Townsend, N. Y.—Oil-cloth.
Tiffany & Co., N. Y.—Silver Ware.
Pratt & Wentworth, Boston—Cooking stoves.
Wright & Co., Philadelphia—Perfumery.
The Hadley Co., Holyoke, Mass.—Spool Cotton.
S. Slater & Sons, Webster, Mass—Cotton goods.
H. Stursburg & Co., N. Y.—Beaver cloths.
Mission Woolen Mills, San Francisco—Blankets, flannels, &c.
F. Sache & Sons, Philadelphia—Fine Shirts.
H. Haupt, Philadelphia—Steam drill tunneling machine.
Deere & Co., Moline, Ill.—Steel Plow irons.
J. G. Perry, Kingston, R. I.—Mowing machine.
Partridge Fork Works, Leominster, Mass.—Spading & manure forks, &c.
Morris Tasker & Co., Philadelphia—Wringing machine.
D. H. Goodell, Antrim, N. Y.—Apple parer.
Haagien & Graflin, Dayton, Ohio—Tobacco cutting machine.
W. & D. Douglas, Middletown, Conn—Pumps.
Howe Scale Co., N. Y.—Scales.
L. H. Olmstead, Stamford, Ct.—Friction Clutch Pulley.
T. R. Pickering, N. Y.—Governor of Steam Engines.
J. B. Root, Boston—Steam Engine.
F. H. & F. M. Roots, Connersville, Ind.—Rotary Blower.
Shaw Uselon Air Engine Co., Boston—Hot Air Engines.
Wickersham Nail Co., Boston—Nail machine.
D. L. Harris & Co., Springfield, Mass.—Lathe machine.
J. S. Justice, Philadelphia—Power Hammer.
C. L. Goddard, Boston—Mestiza Burring Picker.
Southern Cotton Gin Co., Springfield, Mass.—Cotton Gin.
Union Button-hole Co.—Button-hole Machine.
A. B. Howe, N. Y.—Sewing machines.
Bartram & Fanton, Danbury, Ct—Sewing and Button-hole machine.
Mumford & Co., Detroit, Mich.—Boot Former.
C. A. Shaw, Biddeford, Me.—Knitting machines.
J. E. Sweet, Syracuse, N. Y.—Composing machine.
Baltimore and Cuba Smelting Co., Baltimore—Ingot and Sheet Copper.
G. F. Warner & Co., New Haven, Ct.—Malleable Iron Castings.
Danglar Mar. Co., N. Y.—Edge Tools.
S. H. Randall, N. Y.—Mica.
C. G. Gunther & Sons, N. Y.—Furs.
J. M. Humphries, Louisiana—Cotton.
F. C. Williams, Richmond, Va.—Virginia Tobacco.
J. P. Sarrazin, Louisiana—Perrique Tobacco.
A. J. & J. H. House—Co-operators.
Jackson & Co-operators.
J. W. Carroll & Co., Lynchburgh, Va.—Smoking Tobacco.
C. H. Lillienthal, N. Y.—Tobacco and Snuff.
Wisconsin Agricultural Society—Agricultural collection.
Richardson & Co., Wis.—Wool.
A. G. Day, Seymour, Ct.—Rubber goods.
H. G. Hotchkiss, Lyons, N. Y.—Oil of Spearmint, Peppermint, and Wintergreen.
L. B. Hotchkiss, Phelps, N. Y.—Spearmint and Peppermint.
Belmont Oil Co., Phila.—Petroleum.
West Virginia—Petroleum.
Babcock & Co., Boston—Petroleum.
Marietta and Gales Fork Co., Marietta, Ohio—Petroleum.
F. H. Holliday, N. Y. Chemicals.
Joseph Hirch, Chicago—Albumen.
A. Fries, Cincinnati, O—Extracts.
Degener & Weller, N. Y.—Printing Presses.
Fairbanks & Co., N. Y.—Railroad Scales.
Herring, Farrel & Sherman, N. Y.—Fireproof Safes.
J. B. Van Duzen—Model of *Fleeting*.
Brown & Level, N. Y.—Model Tackle.
Department of Agriculture, Washington, D. C.—Cereals of the U. S.
State Ohio—Cereals.
State Wisconsin—Cereals.
State Kansas—Cereals.
W. S. Carpenter, Westchester Co., N. Y.—Corn.
McPherson & Donald Smith, N. Y.—Ales.

HONORABLE MENTION.

C. K. Landis, Vineland, N. J.—Model Farms.
Willard & Co., N. Y.—Objectives.
Wm. Selpho & Co., N. Y.—Artificial Limbs.
Robert Bates, Philadelphia—Instrument to Cure Stammering.
George Davidson, Washington, D. C.—Sextant.
Peter Glass, Boston—Mosaic Inlaid Center Table.
G. W. Chipman, Boston—Carpetings.
Howell Brothers, Philadelphia—Paper Hangings.
New Haven Clock Co.—Clocks.
Kaldenberg & Son, N. Y.—Meerschaum Pipes.
Bell & Co., Alabama—Muslins.
Williams Silk Co., N. Y.—Silk Twist.
Washington Mills, Boston—Shawls.
Linthicum & Co., N. Y.—Spring Overcoats.
J. C. Zeller, St. Louis—Men's Clothing.
State of Alabama—Cotton.
Montague & Carlos, Louisiana—Mosses.
F. S. Cozzens, N. Y.—Cigars from American Tobacco.
Bourgeois & Co., Louisiana—Tobacco.
D. J. Brown, Boston—Leather.
C. Korner, N. Y.—Leather.
H. Tilden, Boston—Sifter.
Metropolitan Co., N. Y.—Washing Machines.
J. Ward & Co., N. Y.—Washing Machines.
S. T. Bacon, Boston—Baking Machine.
J. Prentice, N. Y.—Cigar Machine.
Empire Machine Co., N. Y.—Sewing Machines.
Stephenson & Son, N. Y.—Horse Cars.
Chas. Wellman, N. Y.—Saddles.
E. Page, N. Y.—Cars.
Portland Packing Co.—Canned Food.
Bray & Hays, Boston—Preserved Food.
Townsend Brothers, N. Y.—Preserved Oysters.
Gail Borden, Jr., N. Y.—Extract of Beef.
Oneida Community, Oneida, N. Y.—Preserves, etc.
J. Wattemeyer, Baltimore, Md.—Preserved Food.
J. Davidson, Louisiana—Sugar.
G. Sabatier, Louisiana—Sugar.
D. Avery, Louisiana—Salt.
Vinicultural Society, California—Wines.
Dr. Louis Eleberg, N. Y.—Peat Fuel.
Goodenough Horseshoe Co., N. Y.—Horseshoes.
G. J. McCormick, Meriden, Ct.—Skates.
Lalance, Grosjean & Co., N. Y.—House Furnishing Hardware.
J. F. Paul & Co., Boston—Specimens of Wood.
Isaac Young, Kansas—Specimens of Wood.
Anderson Brothers, Cincinnati, O.—Catawba Wines.
C. Butler, Cincinnati—Catawba Wines.
Pleasant Valley Wine Co., and F. S. Cozzens, N. Y.—Variety of Wines.
American Co., St. Louis—Wines.
S. S. Squire, New London, Ct.—Preserved Food.
Brandon Kaolin and Paint Co., Brandon, Vt.—Specimens of Paint.
A. Tambourz, Louisiana—Tobacco.
H. M. Smith, Baltimore—Petroleum.
Olof Jounson, Louisiana—Sugar.
Purrington & Co., N. Y.—Sweeper.
Minnesota—Cereals.
Iowa—Cereals.
G. & C. Williams, Louisiana—Sugar.
James H. Jackson, N. Y.—Minerals.
Joel Wharton, N. Y.—Minerals.

THE ENGINEER says:—

"Although our Brother Jonathan, impeded by the great distance which his wares have had to travel, has sent but a very small quota to Paris, he has made an admirable selection in what he has sent. We doubt if any nation in proportion to the amount of its exhibit, shows more elaborately and really well-finished workmanship, and certainly none has the imprint of vigorous inventive genius more clearly marked on its productions. Almost every machine and engine exhibited in the main gallery by the United States, has some special peculiarity stamped upon it which, whether it be really an invention or improvement, or only a questionable modification, at least shows the extraordinary activity of North American thought."

As a commentary on the above, we may add a report from Commissioner Beckwith to the Department of State, showing that of the 534 United States exhibitors at Paris, 263, or exactly one-half, received honorable awards. These awards include 4 grand prizes, 17 gold medals, 52 silver medals, 103 bronze medals, and honorable mention of 79 exhibitors.

Exposition Notes.

SHAW'S HOT-AIR ENGINE of 20-horse power, exhibited in an annexe or shed of its own in the park, continues to work regularly, and to attract a good deal of attention. An indicator has been fitted, and diagrams have been taken which show that the engine performs well relatively with the fuel consumed—a promising result in a new engine so widely removed in all essential points from engines of the usual character.

ONE of the most valuable institutions of Paris is the asphalte with which the footpaths and roads are made. The London asphalte, whether for footways or roadways, has been a complete failure, whereas the Parisian is a most eminent success—a result not imputable to the nature of the traffic so much as to the nature of the composition. The asphalte used for the footways after being heated very hot by a fire applied to a cylindrical vessel, with trunnions at the ends, so that it may be tilted and the contents poured out at a large square bung-hole by rotating it by a worm-wheel upon the trunnions, is emptied into buckets, and is spread by hot irons. Whereas that used for the roads is a brown powder consolidated by hot iron rammers, and the surface is smoothed by hot irons, and is finally rolled by a heavy iron roller. The asphalte thus laid is durable, the traction upon it nearly as easy as upon a railway, and one material benefit is that there is hardly any noise.

WE ARE informed that a trial is shortly to take place between French and English guns against French and English armor-plate targets. At this competition, unless the present rules be relaxed, no naval or military officer belonging to either country, with the exception of such as may be nominated jurors for the contest, nor any representative of the press, will be admitted. It is to be hoped, however, that such an absurd rule will be rescinded, and that the public will be permitted to enjoy an equal opportunity of judging for themselves the results of such a contest as is afforded in the case of all other competitive tests of articles or machines in the Exhibition which require such proofs in order to ascertain conclusively their relative merits and advantages.—*Engineering.*

A FRENCH CHEMICAL PRINTING MACHINE is exhibited, printing manifold through prepared paper, without ink, in red or black, and bringing the types into operation by means of keys, with great rapidity. According to the London *Printers' Register*, the specimen on exhibition contains one hundred and forty five letters in seven different kinds of types and two colors—red and black—composed, and one hundred copies printed, all in three minutes. The printing was done in thirty two seconds, and the machines appear to be chiefly intended for cards and bills, letter heads, etc. The colors are good and well printed.

AMONG the carriages are two droska those uncomfortable Russian hackney carriages in which the driver and his "fares" sit in single file astride a longitudinal bench supported on four small wheels.

THE ONLY artillery exhibited in the American court is a Gatling's and a Ferris gun, the latter of which is a polygrooved rifled breech-loader, throwing a ball of 3-lb. weight with a charge of 24 oz. of powder. By the side of this gun is a small piece of iron plate 3-in. in thickness, composed of three 1-in plates bolted together, and through which are several perforations made by shot fired from the gun at 50 yards distance. The total range of this gun, at an elevation of 35 degrees, is stated to be nine miles.

Editorial Summary.

THE HYDRO-PNEUMATIC HOIST, recently patented in England, is an apparatus in which the chain, with a hoisting cage at each end, passes ever two sheaves, so that each cage ascends while the other descends. The power is applied through the medium, alternately, of the weight and buoyancy of a bell-shaped counterweight moving like a piston in a vertical pipe filled with water. The weight being adjusted so as in descending to lift the load of one cage, (the cage itself being balanced by the other and descending cage), on reaching the bottom of the pipe, it is pumped full of air, its capacity being also so adjusted that its buoyancy when filled with air shall be sufficient to lift the load of the other cage. The mode of braking, is by gradually contracting the space for the passage of the water between the sides of the pipe and the bell-shaped weight. The weight can be so geared as to lift the load through twice the distance travelled by the weight.

IRON ETC.—A co-operative foundry has been established in Rochester. The organization has purchased the Novelty Works, for the sum of $30,000.——The Shepard Iron Works, of Buffalo, have recently built an engine for the City Water Works, cost $40,000, beams, 22 feet long, fly wheel 24 feet in diameter, and 40 tuns in weight.——The Arms Company, of Newburyport, are manufacturing machines for carving wood, marble, stone and copper.——The Providence Tool Company have contracted to furnish the Swiss Government with 15,000 Peabody rifles and to alter 44,000 muzzle-loading muskets to breech-loaders.——The rolling mills recently started at Portland have orders for six months ahead. They turn out about 1,000 tuns of railroad iron per month, one-half of which is taken by the Grand Trunk Railroad Company.

A STEEL SCREW PROPELLER, one of the first we believe of any considerable size, has been cast by Messrs, Naylor, Vickers & Co., of Sheffield, and is really a very fine piece of work considering that it is a first attempt. The screw is three-bladed, 19ft. 2in. diameter, and 21ft. pitch, and weighs 1 ton 18 cwt. 3 qrs.; a cast-iron propeller of the same dimensions on the sister boat Leeds, weighing 2 tons 12 cwt. 2 qrs.; representing 13 cwt. 3 qrs. in favor of steel. The steel screw might have been lighter, but Mr. Bretelle, chief of the marine department of the company, for whom it was made, feared to reduce the proportions too much in the absence of further experience.

HYDRAULIC PROPULSION.—It is more than likely that the system of propelling by means of centrifugal pumps will prove very successful in its application to canal boats. The North Moor Foundery Company are now engaged in executing an order for fourteen boats, each about 40 tuns burden, the whole of which are to be propelled on the above system.

THERE are now 400 mills for crushing quartz and cement in California, 40 in Idaho, 30 in Montana, and 11 in Oregon, which have cost nearly $10,000,000 dollars.

EXPERIMENTS (says the *Ost*) are being made by the French Government upon a system of construction for cannon, by which the interior is made of steel and the exterior of bronze. This plated cannon is expected to give the greatest amount of wear with the least risk of explosion.

OZONE.—In another column we publish a notice of an English Patent, issued sometime since, for decolorising sugar by means of ozone. The generator employed for this purpose consists of a number of flat sheets of glass, coated with tin-foil, and piled one on the other, but slightly separated. Each plate represents a Leyden jar, and when the whole number are electrified, a stream of air forced through from one end to the other becomes so strongly ozonised that breathing it is painful and dangerous. The stream of ozonised air thus produced can be used for bleaching and other chemical purposes.

A PORTABLE COMPRESSED ATMOSPHERE, similar to Galibert's, is carried by the divers of the American Submarine Company, dispensing with all communication with the general atmosphere, both for the sustenance of life and of combustion within their lamps. The compressed air in the reservoir is also, by turning a cock, allowed to expand into and distend a pair of floats attached to the diving dress, by which the diver can ascend to the surface and float, head and shoulders out of water. A charge of air will last under water about four hours.

EXPERIMENTS have proved that if magnesium riband is pressed broader and thinner, and by this means made to present a larger surface to the oxygen of the atmosphere for the same weight of metal, it burns much more steadily and surely.

BUSINESS AND MANUFACTURING ITEMS.

RAILROADS, ETC.—The Boston, Hariford and Erie Railroad Co. intend to establish coal deposits at all the stations on their road, from which residents in the vicinity can procure their supplies at moderate prices.——The Western Railroad is altering its heavy freight engines to coal burners, at its shops in Springfield.——Dull & Gowan, the new contractors on the Hoosac tunnel, will immediately put on a force of 200 men, so that the work will be carried on night and day. They will also sink two shafts, that the excavations may be made from six faces at the same time.——New Haven has voted, 3,256 to 473, to subscribe $200,000 to the capital stock of the New Haven and Derby Railroad.——The Chicago, Rock Island & Pacific Railroad Company has been mortgaged to John A. Stewart and Wm. H. Osborn, of New York, for the sum of nine million dollars. The revenue stamps amounted to nine thousand dollars.——The land telegraph from Gainesville, Florida, to Punta Rosa, and which will there connect with the marine cable to Cuba, is finished. The line, 375 miles long, was built in 37½ days. It will be connected with the Western Union Line at Lake City, Florida, and a line will be built to connect that place with Savannah and Georgia. The submarine cable to Cuba will be laid in July.——A company of Eastern iron manufacturers have gone on an excursion to the mining regions in South East Missouri. They propose to furnish $800,000, if the people of St. Josephs will subscribe $300,000, and finish the St. Josephs & Council Bluffs Railroad by January next.—The work on the Chicago tunnel has been stopped by the caving in of the whole structure.——The Hudson River traffic, for the first time in several years, is excited by high competition for freight and passengers. The Athens "cut off," a new branch built by the Central Railroad Company, from Schenectady to Athens, on the Hudson, was opened in May for passenger traffic, the magnificent palace steamers *Drew* and *Dean Richmond* of the People's Line, running in connection with the trains. The same concern continue to run their Albany boats as usual, but the Troy line, consisting of the *Connecticut* and *Hero*, wages an old fashioned opposition and has knocked down the fare, step by step, to fifty cents from New York to Troy. In freight, the Hudson River Railroad endeavors to head off the Athens "cut off," by reductions in rates, but the steamers have the cheaper highway.——A new way to use steam on canals without agitating the water, is under trial at Buffalo, with a view to the formation of a company to apply the plan throughout the Erie Canal. A steel wire cable, stretched from point to point, takes a turn around a drum worked by steam on the deck of the vessel, which is thus quietly propelled.——Bergen Cut, between Jersey City and Newark, is to be laid with steel rails; preceding trials having satisfied the company of the economy of the change, which will probably be carried gradually throughout the line to Philadelphia.——The Summit Tunnel, on the Pacific Railroad, is progressing at the rate of sixty feet a week, at four points, and at this rate will be completed by the middle of August.

MISCELLANEOUS.—About 200,000 quarts of strawberries are brought to New York every day from New Jersey and other places South. The sales of strawberries at Vineland amount to $2,000 per day. A farmer near Salem, Ill., sold his strawberry crop of forty acres, to parties in Chicago, a few days ago, for $50,000.——The editor of the *California Farmer* acknowledges a present of a lot of large and delicious oranges from a tree which had 464 oranges on it on the 18th of January, and has 100 left, while its top is covered with the blossoms of another crop.——The Peruvian Government contracts with a firm in Philadelphia for 1,200,000 bags a year for packing guano.——The Internal Revenue Department in the first sixty days of the vigorous enforcement of the new whisky law condemned 97,200 gallons of whisky, besides about 250,000 gallons under seizure.——Western farmers are crowding their grain to market. In Delaware county, Iowa, the price of wheat fell within a few weeks from $2 25 to $1 50.——The Chicago City Directory this year, about to be published, contains 89,103 names, being an increase of 12,889 over the number contained in the Directory of last year. The rule in cities, to ascertain the total population, is to allow three persons to every name enumerated in the Directory. According to this rule Chicago now has a population of 267,309.——Forty steamboats bound for Fort Benton, Montana, laden with a hundred and twenty thousand tuns of freight, have passed Sioux City, Iowa, this season.——The annual report of the Merrimac Manufacturing Company shows dividends to the amount of 25 per cent, a reserve fund of $515,079 61, and stock on hand $544,248.——During May the aggregate losses in the United States, caused by fire, each involving a loss of at least $20,000, were $2,120,000. The aggregate losses during this year, thus far, have been $16,528,000. From 1859 to 1864 inclusive, the average losses by fire in the United States were about eighteen millions of dollars per annum, while in 1865 they rose to $43 000,000, and in 1866 to $100,000,000. It is supposed that $50,000,000 insurance was paid during the last year for incendiary fires.——Most of the silk manufacturers of New Jersey return no incomes, and the cotton profits are returned very much reduced. At the Clover Hill coal mines, in Virginia, the fire has been extinguished, and the preparations to resume work are being made rapidly——The *Liverpool Albion* says that negotiations are pending for the formation of a new and influential company, with a large capital to run the *Great Eastern* between New York and Brest, in connection with the Paris Exhibition, as it is believed, despite the failure of the first company, there are elements of success in the undertaking.

Recent American and Foreign Patents.

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

CASE FOR HOLDING PRESERVED MEAT AND OTHER SUBSTANCES.—E. C. Dawson. October 12, 1866.—In performing this invention the case is composed of wood, and is lined with plaster of Paris, so as to protect the preserved meat or other substance from the action of the air. After the preserved meat or other substance has been packed in the case, a covering of paper, leaves, or other suitable material is placed over the preserved meat or other substance, and a coating of plaster of Paris, in a state of suitable consistency, is spread over such covering and allowed to set. The lid of the case is then fastened down in the usual manner.

PIPE FOR HOLDING AND SMOKING CIGARS AND TOBACCO.—W. Grune. Oct. 13, 1866. Having discovered that the ammonia vapors evolved when tobacco or cigars are smoked, are capable of reproducing or re-developing silvered photographs on paper, discolored or bleached with chloride of mercury, the inventor has contrived cigar or tobacco holders which will hold the papers so that when the smoke is drawn inwards the ammonia vapors will act upon the paper and cause the photograph to be developed.

APPLYING ENAMEL TO CERTAIN FRICTIONAL SURFACES.—L. B. Bodmer. Oct. 13, 1866. This invention consists in providing those metallic surfaces which are exposed to a rubbing action or friction against leather, as, more especially, the guide bars for the buffalo-hide drivers or pickers, with a covering or coating of enamel, glass, or other vitreous substance, whereby the friction is reduced and the application of a lubricant rendered unnecessary.

REFINING OR DECOLORISING SUGAR AND SIRUP.—E. Beanes. Oct. 12, 1866. In performing this invention the patentee submits sugar, in a dry or moist state, or in solution, to the action of ozone, either with or without pressure, until the sugar, sirup, molasses, or other saccharine solution is decolorised to the desired point. Pure ozone may be obtained by passing dry oxygen gas through an ozone tube or generator in connection with an induction coil and galvanic battery, or by various other means. The inventor only finds it necessary for his object to pass atmospheric air, by preference previously dried, instead of oxygen, through the ozone pipe or generator, as above explained, and from which the ozone is conveyed by a pipe to a vessel containing the sugar, sirup, molasses, or other saccharine solution to be acted upon.

DETECTING APPARATUS, ETC.—J. E. Buerk. Oct. 12, 1866. This invention consists chiefly in the combination with the ordinary parts of a watch or clock of certain registering devices, which are operated by suitable keys to form impressions or perforations upon dials or indexes of card, paper, or other similar material, the exact time at which each impression is formed being shown by figures or other characters upon the said dial representing the hours and other usual divisions of time.

MEAT CUTTER.—W. M. Miller, Tulpehoccan Pa.—The circular meat block has a rim, and rotates on a vertical axis upon the bench, by means of cogs on its periphery which are engaged by a spiral flange on a drum: this derive its motion by a band from the axis of the wheels whose cogs lift the spring arms; to these are attached the cleavers which cut the meat upon the rotating block beneath.

EVAPORATOR.—Samuel Page, McAllisterville, Pa.—In this evaporator an adjustable plate or bottom is arranged beneath the receiving or skimming pan in such a manner that the heating flue of the latter may be enlarged or controlled so as to increase or diminish the heat as occasion may require. The finishing pan rests upon the walls of a chamber arranged at one side of the main flue, and a novel arrangement of dampers controls the heat within said chamber, or excludes it entirely therefrom, as may be desired.

SHACKLE BLANKS.—J. B. Clark, Plantsville, Conn.—This invention relates to the construction of a carriage shaft shackle from sol blanks, and to the shape of the dies for forming the same, so that with the least amount of labor and power, the said shackle may be gradually formed into the required shape.

VENTILATING FUNNEL.—Frederick Catlin, Watertown, Conn.—This invention consists in connecting the funnel with a stand, and in arranging a valve in its throat, and also providing for thoroughly straining the liquid.

OIL CUP.—T. Lunkenheimer, Cincinnati, Ohio.—This invention consists in the peculiar construction of the cup whereby it is adapted to the use of tallow and other lubricating material, and whereby the chamber which contains the oil or lubricating material, is made air-tight.

MOWING MACHINE.—Caleb Lee, Sandy, Ohio.—This invention relates to important and valuable improvements in mowing machines, and consists in providing a double joint at the forward end of the drag bar in line with the crank shaft. It also consists in the use of a jointed brace, also on line with the crank shaft, and in constructing and locating the crank shaft box so as to strike the frame and cause the outer end of the cutter bar to raise as the elevating lever is forced down, for elevating the same.

SHAFT COUPLING.—N. H. Shaw, Swanton, Vt. Patented May 14, 1867.—The shaft coupling embraced in the present invention, is made in two parts or sections, placed one upon the other and both turning at one end upon one end of the bolt, stirrup or strap, encircling the shaft and forming the means of fastening the coupling thereto; while at other ends between the car pieces at such ends, is hung, by its T-shaped end, the strap or bar secured to the carriage axle, this construction of the coupling enabling the wear of the shaft strap to be compensated for or taken up, from time to time.

GRAIN SIEVE.—H. S. Townsend, Greenvale, Ill.—This invention consists in the application of an additional shoe, outside of and above the ordinary grain shoe of a fanning mill or thrashing machine, whereby the sieve is prolonged, and the grain or seed passed over a larger perforated surface Thereby the complete separation of the fine from the coarse grain or seed will be effected. The invention also consists in the use of strong wire supports, which are arranged under the wire netting, to keep the same flat, and prevent it from sacking.

HAY GATHERER.—J. F. Swinnerton, Marion, Ohio.—This invention has for its object to furnish a machine for hauling and delivering hay at a stack, simple and durable in construction, easily operated, and which will take the hay from a windrow, rendering the labor of previously cocking it wholly unnecessary.

ELEVATED STREET RAILWAY.—F. A. Williams, Clovesville, N. Y.—This invention relates to a new and useful improvement in elevated street railways its object being to so arrange and construct the posts or pillars, by which the rails are supported, that they do not occupy more space on the sidewalk of the street and are in no manner more inconvenient, than the common lamp posts; so that a railway constructed on this improved plan would be no inconvenience to the pedestrians on the side walks or to the vehicles on the street.

PLANTING HOE.—Augustus Williams, Sebec, Me.—This invention relates to a new and improved method of depositing seeds in the ground, and covering the same.

STEAM BOILER.—Henry McDonough, N. Y.—This invention consists in the arrangement of valves at the ends of a tubular steam boiler in such a manner that the heated gases and products of combustion are retarded and detained in their passage to the chimney, and thereby compelled to part with their caloric.

FRUIT AND POULTRY BOXES.—D. B. Spinning, Brooklyn, N. Y.—This invention relates to a novel manner of constructing boxes of that kind, which are used for transporting fruit, poultry, vegetables or other articles to market, and which are so arranged, that they can be folded together, when to be transported back, empty to the farms or places, whence they were sent. Although these boxes will be slightly more expensive to construct, than those now in use, the reduction of return freight will, it is claimed, in a few trips, more than twice repay the difference.

MACHINE FOR MAKING BUTT HINGES.—Adrian Rais, Waterbury, Conn.—This invention relates to an improvement in machinery for bending the knuckles of butt hinges, by means of a single die at one operation, instead of two distinct operations with separate dies, thereby simplifying the mechanism and manufacturing hinges more rapidly and economically.

AMALGAMATOR.—J. B. Forissier, New York City.—This invention relates to an amalgamating apparatus in which several baths of mercury are employed in order to obtain a large area of amalgamation. This object is obtained by arranging in an upright cylinder a series of stationary annular pans between which a series of revolving annular pans are arranged; each of the pans containing mercury, and the water with the ore falling from one pan to another. The water falls alternately from the center of the stationary pans, and from the circumference of the revolving pans upon the pan below, thus passing in a zig-zag line from top to bottom of the apparatus, and comes in contact with the whole surface of the mercury in each pan, thereby striking a larger area of mercury than is done by any apparatus now made.

WASHING MACHINE.—M. McEnerney, Birmingham, Ct.—This invention consists in a machine for washing clothes, rags, etc., by means of two circular corrugated plates or disks, between which the clothes are placed, said plates or disks being arranged and hung so that the one can be revolved, and in contact with the other, which is stationary, and thereby produce the desired rubbing or scouring of the clothes.

PILL MACHINE.—W. V. V. Wilson, Savannah, Ga.—This invention consists in the arrangement of adjustable rails on the sides of the board of a pill machine, in such a manner that said rails can be raised or lowered to correspond to the diameter of the pills to be produced, whereby the rolling of the dough is materially facilitated.

SHEEP FEED RACK.—Joel J. Smith, Barnesville, Ohio.—This invention relates to a sheep rack and feeding trough combined in such a way as to facilitate the feeding and economize the feed, and consists of a rectangular box perforated to admit the sheeps' head. The bottom consists of a pair of doors turning on pivots, for convenience in clearing out the rack. The troughs are inside the rack, and when feeding rest upon the bottom, but when not in use are elevated out of the way by a simple lever arrangement by which they are carried into a position just over the perforations in the rack, and beneath two pivoted shields which serve to protect the troughs and the feed and prevent the latter from being spilled when being placed in the troughs.

CASTER.—James T. Barnes, Hudson City, N. J.—This invention relates to a new and useful improvement in a caster, for which Letters Patent were granted to this inventor, bearing date Oct. 30, 1866. The invention consists in having the shank of the caster at one side of the axis of the wheels, whereby the caster is allowed to turn, so that the wheels, when the article to which they are applied is moved, may adjust themselves in line with the movement of the article. The invention also consists in a novel manner of securing the metal socket or sheath in which the shank of the caster is fitted, in the leg or bottom of the article to which the caster is applied, whereby the socket or sheath may be secured in the leg or bottom of the article with the greatest facility.

TOILET GLASS.—Albert Ober, Beverly, Mass.—This invention relates to a new and improved toilet glass, whereby the back part of the head may be seen. The invention is more especially designed for the use of ladies to aid them in arranging and adjusting the hair at the back of the head. The invention consists substantially of two mirrors, one of which is hung on pivots in a frame, and the latter connected by hinges or joint to a series of frames also connected by hinges, and the outer frame of the series provided with a mirror; all being so arranged that the two mirrors may be adjusted in such relation with each other, that a lady, for instance, by looking into the mirror which is hung on pivots, may see distinctly the back of her head, and be enabled to arrange, adjust, or dress her hair on that portion of her head with the greatest facility.

WIRE FENCE.—Lucien B. Smith, Kent, Ohio.—This invention relates to an improvement in the construction of a wire fence, especially adapted to use in the prairies of the Western States where timber is scarce, and fires frequently sweep over them, destroying every thing that is combustible.

TABLE.—H. C. Hardey, Muncie, Ind.—This invention relates to a new and useful contrivance for aiding in raising and lowering the leaves of an ordinary dining table, and consists in connecting weights to hang under the bed of the table, with the sliding supports usually employed to hold the leaves when they are raised, which weights draw upon the supports at the time the leaves are raised, and throw them out under the leaves to support them.

SAW MILL.—Joseph Hubbell, Zanesville, Ohio.—This invention relates to new and useful improvements in saw mills, and consists in devices and arrangements for operating the head blocks, and setting the logs for a saw with perfect accuracy, to cut boards of uniform thickness.

CULTIVATOR AND COTTON PLANT THINNER.—Geo. W. Chambers and Isham Washam, Talladega, Ala.—This invention relates to an improved machine for thinning and cultivating cotton plants.

PROCESS FOR EXTRACTING AND SEPARATING GREASE AND OILS FROM ANIMAL AND VEGETABLE SUBSTANCES.—Joseph Besso, Philadelphia, Pa.—This invention relates to an improved process for separating and extracting the oils and fatty matters contained in unwashed wool, bones, oil cake, seeds, or other animal and vegetable substances, whereby wool especially is thoroughly cleansed and purified, and the oil it may contain is separated and utilized with great economy, instead of being wasted and lost at great cost in the ordinary method of washing and cleansing wool with soap.

CONFECTION.—E. C. Maltby and Edward Smith, Northford, Conn.—This invention consists in preparing the meat of the cocoanut so that the same may be preserved and kept an indefinite period, and used at any time.

TRAM AND SELF-CENTERING DISH STAFF.—Samuel Mills and J. R. McIrvin, Clinton, Ill.—This invention relates to a new and useful implement or device for centering hubs and scribing the circumference of wheels, and also for dishing wheels, which implement I term a tram and self-centering dish staff, and by which wheels of any desired size may be scribed precisely from the centre of the hub and the exact dish given a wheel as may be required.

ANTI-COLLISION AND CODE SIGNAL LAMP.—Joseph Wall, New York City.—This invention relates to a new and improved anti-collision and code signal lamp, adapted for vessels at sea to prevent collisions; and affords a complete method of communicating information of any description between vessels at night.

SHEEP RACK.—John D. Munson, Tyre, N. Y.—This invention has for its object to furnish a simple and convenient rack for feeding sheep with hay or grain, and which can be readily taken apart for storage.

FRAME FOR STRETCHING WET LEATHER.—Ichabod W. Dawson, Newark, N. J.—This invention has for its object to furnish an improved frame upon which hides may be extended for drying, which shall be so constructed that the hides after being extended upon the frame, may be stretched so as to bring out all the wrinkles, folds, etc., leaving the surface of the leather smooth and better prepared for the subsequent operations.

GATE.—J. B. Powell and S. H. Everett, Macedon, N. Y.—This invention has for its object to furnish an improved gate, so constructed and arranged that it may be opened or closed by the driver without getting out of the carriage.

SULKY PLOW.—Israel Wing, Earlville, Iowa.—This invention has for its object to furnish an improved sulky plow, so constructed as to be easily operated, and the plows of which can be easily brought nearer together or spread further apart as may be required.

POTATO DIGGER.—Joel E. Giles and Charles S. McRobert, Meads Mills, Mich.—This invention has for its object to furnish an improved machine, by means of which potatoes may be readily and conveniently dug and separated from the soil raised with and adhering to them.

EXTENSION STEP LADDER.—Henry T. Smith, Brooklyn, N. Y.—This invention has for its object to furnish an improved step ladder, so constructed and arranged that it may be extended as desired to adapt it for use in rooms with different hight of ceiling, and so that one part may be extended independently of the other to adapt it for use upon a stairway.

GUIDE FOR CARDING MACHINES.—F. W. Albertine and E. T. Albertine, Hanover, Conn.—This invention has for its object to furnish an improved guide for carding machines, by the use of which the carding will necessarily be done all over the cylinder, so that the tumbler, cylinder, and fancy, will be worn even, and not in creases, rendering it unnecessary to grind so often, wearing the carding clothing evenly, and doing better work.

MACHINE FOR SOFTENING OR DRESSING LEATHER OR SKINS.—F. J. Burcham, Racine, Wis.—This invention has for its object to furnish a convenient and effective machine for softening or dressing leather, particularly buckskins, calfskins, kid, etc., but equally applicable to other kinds of skins, whether having the hair on or off.

SHOVEL PLOW.—Daniel Gilbert, Carbondale, Ill.—This invention has for its object to so improve the construction of shovel plows as to increase their strength and steadiness in working, and so as to adapt them to all kinds of work.

MACHINE FOR UNHAIRING HIDES.—Judson Schultz, Ellenville, N. Y.—This invention has for its object to furnish an improved machine, by means of which hides may be unhaired, and leather scrubbed, scoured, or washed conveniently, thoroughly, and rapidly.

MACHINE FOR UNHAIRING HIDES.—Elias Brock, Ellenville, N. Y.—This invention has for its object to furnish an improved machine for unhairing hides, and scrubbing, scouring, and washing leather conveniently, rapidly, and thoroughly.

WASHING MACHINE.—James M. Noble, Delhi, Iowa.—This invention has for its object to furnish an improved washing machine, simple in construction and operation, not liable to get out of order, and combining within itself many of the utensils ordinarily employed in washing clothes.

HANDLE ATTACHMENT FOR BLACKING BOXES.—Thomas S. Robinson, New York City.—This invention is designed to supersede the different holders now manufactured to receive and hold blacking boxes while the same are being used, the holder serving as a handle for the box, and preventing the hand of the operator being soiled by the blacking while charging the brush with the same.

WRENCH.—J. V. H. Secor, New York City.—This invention relates to a new and improved wrench of that class which are provided with a sliding jaw, and it consists in a novel manner of applying the sliding jaw to the shank of the wrench, whereby the former may be readily moved on the shank and adjusted to the nut to be turned, and firmly secured in position, after being thus adjusted, and while operating upon and turning the nut.

BACK SAW.—Edward H. Roe, Jersey City, N. J.—This invention relates to a new and useful improvement in what are commonly termed by joiners back saws, and has for its object the straining, by a simple means, of the saw plate whenever the same becomes bent or "kinked," as it is technically termed, so that it may be brought in a plane and have a straight cutting edge, or one free from lateral bends or kinks. These back saws have their plates, as they are used for fine work, the cutting of tenons, etc., and the plates are consequently very liable to become bent or kinked, so much so as to frequently render it difficult to use them and make a smooth kerf or cut.

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 advertisements at 50 cents a line, under the head of "Business and Personal."

F. A. W., of Miss.—Supposes that the moon's atmosphere presses on the earth's atmosphere, and hence the tides, etc. etc.

E. J. B., of Wis.—"Why is it that an apple scion, produces fruit of its own kind when grafted into a stock of far different and inferior quality? I do not assume to know anything about it, but would like to understand it." So would we.

C. M. S., of N. Y.—To make whitewash which will not rub off, add to it a little sugar or molasses.

F. F. L., of Pa., has failed lately to get a japan varnish for small articles of iron which gives a good gloss. He ought to try another brand of varnish or manufacture for himself.

G. A. S., of Mass.—Shellac and rubber have the property of toughening fusible cements, also they render them less fluid when melted. We cannot answer you more definitely until you give us further details of the use of the cement.

J. W., of N. Y.—The questions you send belong to ordinary mensuration and we refer you to any good treatise on arithmetic for their solution.

R. B. N., of Me.—The simplest way to determine the hardness of water, is to observe its effect on soap. The soap test is in fact generally used by chemists. The solid contents of hard water are left on complete evaporation of the water.

T. R., of N. Y.—We do not understand the construction of pegging machines sufficiently to explain the method of finishing the cams. . . Jessop's, or Sanderson's are excellent brands of tool steel. Some American steel is also recommended. . . A set of ten taps such as you desire from one quarter to one and a half inches, is worth six or seven dollars.

E. C. H., of N. H.—The iron pavement you speak of as having been used in Court street, Boston, has been tried here, and remains of it are still to be seen in Cortlandt street, this city. It is not satisfactory, being displaced easily and breaking. We do not think your plan of making the sections of extremely hard iron would improve it.

E. W. N., of Mass.—Your rule for ascertaining the area of a circle where diameter and circumference are known, by multiplying one half the diameter of the circumference by one-half the diameter is only another way of stating the rule given by Rowland Hill on page 376, of No. 24, Vol. XVI. Either of them are sufficiently correct for ordinary practical purposes.

H. M. C., of Pa.—This correspondent wishes to drive a circular saw by one man's power which requires four horse power now to drive it! He proposes a wooden fly wheel 30 feet in diameter having on its shaft a pulley to run the saw, and asks if he can *gain* the necessary power by turning the concern with a crank by the hands of one man. We reply by asking another question: If *power* can be gained by the use of a fly wheel where is the limit, and what is the necessity of steam power for any purpose?

J. C. S., of Iowa.—Of course it is the duty of steamboat men as pilots, engineers, etc., to inform themselves as to the laws that govern steam vessels. We have no space to publish the laws on this subject; they may be found in the proper official documents.

W. H. H. H., of Pa.—If we understand your query it is this, when simplified: "Can I get more power to overcome obstructions—as unevenness of surface on land—with a traction engine, double cylinders, 7-inch diameter, 100 lbs. pressure, 135 strokes per minute, by gearing down to 15 revolutions (1-9 on the main shaft of my machine, than I could by using a cylinder of nine times the area—nearly 21 inches—same length of stroke, pressure of steam, etc., and attaching connections directly to cranks on the machine shaft, which must, of course, make only fifteen turns per minute." We reply that for the purpose intended—a "plowing machine"—we think your swiftly running engine, if properly connected would be better adapted to the work, as you would gain momentum of the driving parts to assist in surmounting occasional obstacles.

J. B. R., of Pa., says he was on board the U. S. sloop of war *Dale* in 1857 and that it was a common practice to rub a greasy rag around the muzzle of the guns before firing salutes, in order to secure well formed smoke rings. The greasing process was very effective and certain

L. G. G., of N. C.—The mineral sent by you is iron pyrites. The pyrites of your State always contains gold.

T. M. Jr., of O.—The popping of corn is explained by the expansion of air or gas contained within the kennel; it is a case of explosion. The substance of the kernel at the instant of the explosion appears to be tough and plastic.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Wanted—Parties to engage in all kinds of manufacturing at Coloma, Ill. See advertisement and address A. P. Smith, Sterling, Ill.

Publishers of Weekly Newspapers send specimen copies with advertising terms to Joel K. Reiner, Line Lexington, Pa.

For Sale Cheap—One French Pin-escapement Regulator and a small Foot Lathe. Address James H. Flynt, Shelby, Ohio.

The United States Patent Office issued, among other Letters Patent for Sewing Machines to JOSEPH W. BARTLETT *two* patents for "*new* and useful designs for sewing machines" One of these patents is for a *circular form*, the same as that FIRST used in the Bartlett Machines, the other for an elongated long arm form, it being found that this latter form possessed *advantages over* the CIRCULAR form, giving greater space to the "work," etc., and from a similarity of the Bartlett patent CIRCULAR form to that of the Willcox & Gibbs. Mr. Bartlett, therefore, being desirous to give as distinct a character as possible in the best form to his machines, determined, some fifteen months ago, to adopt the use of the "long arm" form, caused the models to be made and their manufacture begun. They are to be seen at the General Office, No. 569 Broadway, New York City. SEE ILLUSTRATION OF THE MACHINE IN "HARPER'S WEEKLY," July 6.

J. W. Bartlett:—DEAR SIR: At your request we state that the agits brought by us was only to prevent the use of the letter "G" form, and does not affect or interfere with your right to make or sell Sewing Machines in the form patented by you published in the SCIENTIFIC AMERICAN Nov. 18, 1865.

Signed WILLCOX & GIBBS S. M. CO.

NEW YORK, June 3, 1867.

Improved Plow Mold Boards.

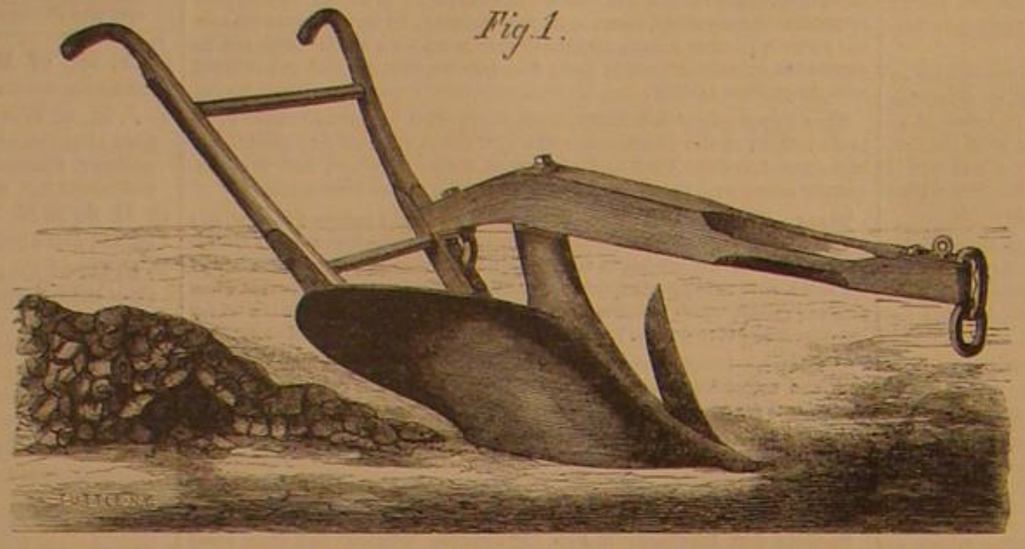
The advantages claimed for this plow over others is a diminution of side draft, a lessening of friction, and an ease of manipulation, derived from the fact that its construction is based upon fixed and correct mechanical and geometrical principles. The surface of the mold board is laid out with square and compass, every line bearing its exact proportion to any other at every other point. The surface of the mold is really an inclined plane, curved, with no abrupt turns nor side friction.

Fig. 1 is a perspective view of the plow and shows merely its general appearance and not its special and distinctive characteristics: these are seen in the diagram marked Fig. 2. The diagonal longitudinal line across its face, from lower point to upper, is a right line on which a straight edge bears perfectly the whole of its length. The cross lines present also a perfect surface from the base upward.

By placing one angle of a square on the base of the block from which this diagram is taken, and moving forward the block, turning it as moved, the tongue or other angle of the square will engage with the whole surface, point by point, in succession. Of course it will be seen that the face of the mold is a true inclined plane, curving like the movement of a spiral or screw. Thus the soil is not crushed against the mold board, bent nor strained, but slides gradually up the incline to a perpendicular, when a slight outward projection of the upper rear portion of mold board inclines it to the outer side and it falls by its own weight.

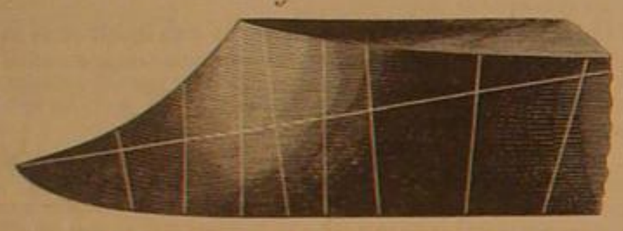
It must be evident that heavy, stiff soils can be worked with great ease by a plow designed on these plain geometrical principles, and experience has proved that this plow is an exceedingly easy working one. The soil will not adhere to the mold board, and, as the plow itself is parallel with the beam and not at an angle, the side draft is reduced to its minimum.

Fig. 1.



RIDER'S GEOMETRICAL PLOW.

Fig. 2



Patented Oct. 30, 1866, by L. P. Rider. For further particulars address Moseley, Rahm, & Co., the owners of the patent and manufacturers of the plow, Pittsburgh, Pa. The right for the Eastern States for sale.

Purification of Polluted Waters.

Pulverized charcoal has always been recognized as furnishing a most valuable filter for clarifying water containing organic or inorganic substances. A paper was recently read before the London Institute of Civil Engineers embodying the results of a number of carefully conducted experiments made for the purpose of definitely determining just how far the statements made regarding the action of this substance in purifying water, might be depended on.

The details of four sets of experiments were given, the first on animal charcoal, of which nearly 5 lbs. new and freshly burned, and of the degree of fineness used in sugar refineries, were packed in an ordinary stoneware filter. The water employed (of which a complete analysis was given) contained, in the gallon, organic matter, 10.80 grains; inorganic matter, 88·30 grains. The hardness of the water, before boiling was found to be 50·50°, and after boiling, 33°; and the oxygen required to oxidize the organic matter contained in in one gallon, amounted to 0.0116th. part of a grain. Several gallons of the water were allowed to percolate slowly through this charcoal, and upon examination afterwards, it was found that, of the inorganic matter which had originally existed, 52·60 grains were removed from the first gallon; but from each succeeding gallon less and less; so that from the twelfth gallon of water that passed through the charcoal only 8·80 grains of inorganic matter were removed. Of the organic matter 4·80 grains were removed from the first gallon; but, with a gradual decrease, the charcoal ceased to remove any organic matter after the sixth gallon. In fact, immediately afterward, it commenced to give back a portion of the organic matter removed in the first instance, the quantity returned to the twelfth gallon amounting to 1·55 grains. Thus, of the 12·54 grains of organic matter removed by the charcoal from the first six gallons of water, as much as 4·98 grains were given back to the next six gallons; from which the author concluded that, had this set of experiments been carried a little further, all the organic matter removed at first by the charcoal would have been given back again.

The second and third series of experiments were with wood and peat charcoal, which, however, were still less satisfactory than those with animal charcoal. The fourth set of experiments was on animal charcoal, with water previously treated with permanganate of potash slightly in excess. After remarking that the water, in its passage through the charcoal, was found to contain organic matter, apparently in the same quantity as before treating it with the permanganate, attention was drawn to a comparison between the first and fourth sets of experiments, to show how closely they agreed to contradict the general statements made as to the removing power of charcoal, and to demonstrate how very little indeed could be done by this filtering material, even on a small scale, toward the purification of water.

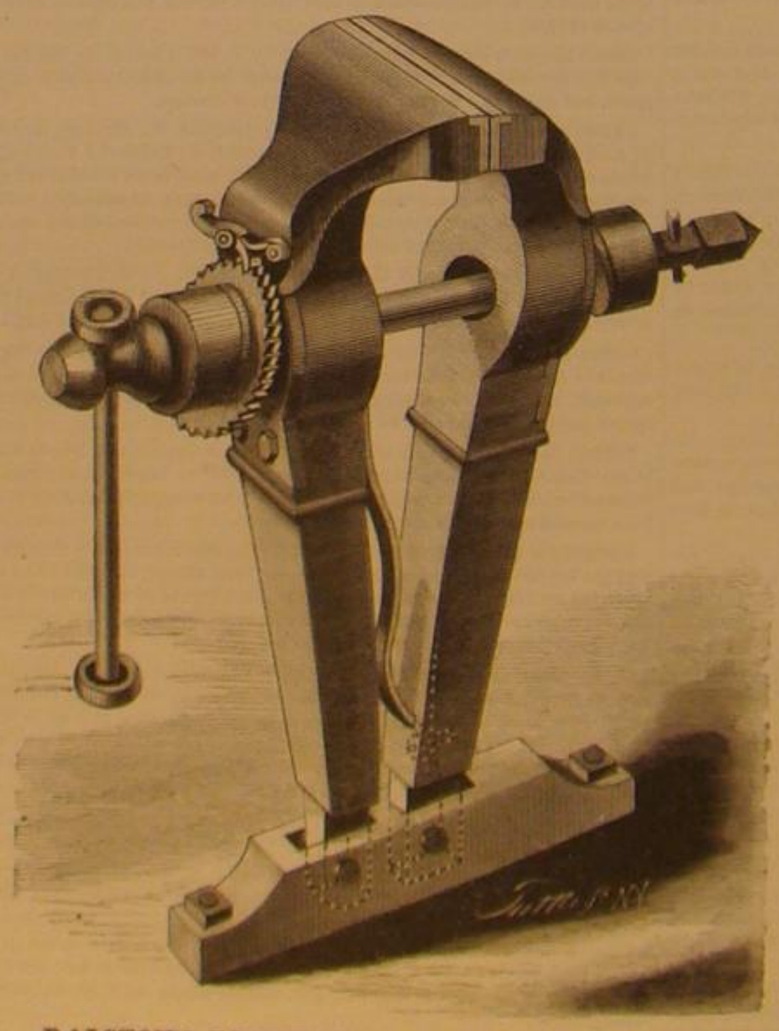
The author in conclusion gave it as his opinion that, as by chemical agency bad water could be purified to a very limited extent only, the public mind should more than ever be given to the great question of supply; and as people valued their lives, they should above all things, in their choice of a source, not be too much influenced by distance, but be willing to undergo the necessary expense of securing the object of their search, not only in abundance but in the greatest purity.

Combined Wood and Iron Pavement.

J. B. S. proposes a street pavement composed of square blocks of wood put together in sections on a frame of cast iron which extends about half way up the sides of the blocks; these sections to be prepared at the manufactory in sizes to suit and transported to the place where they are to be laid. He would use resinous wood or wood kyanized, uniting the joints with resinous matter. We see no real advantage in the use of the iron. Already sections of wooden pavement are made in a manner similar to that proposed, except that no iron is employed.

Improved Device for Working Vise Jaws.

The object of this device is the quick opening and closing of the jaws of vises, as in no case is it necessary to turn the handle lever more than half around. In place of the screw and sheath, a bar passes through the jaws, the apertures being large enough to allow of the reciprocating movement of the jaws. On each end of the bar, outside the jaws, is fixed a disk having an inclined face, that is a disk one edge of which is much thicker than the other, working against steel faces on the outside of the jaws.



RALSTON'S DEVICE FOR CLOSING VISE JAWS.

It will be seen that as the bar with the disks is turned in one direction the spring will force the jaws apart, and if in the other direction they will be closed firmly. Attached to one of the disks is a ratchet wheel, which by means of a spring pawl secured to the vise, is held in any position. Thus the jaws can be secured to suit the thickness of the article held between them. The back disk may be moved upon the bar to allow the vise to open more or less, and held by a pin passing through the bar. The foot also of the movable jaw can be set by changing its pivot to other holes in the base. Not only can it be closed firmly by a single half turn of the ratchet, but it can be instantly opened by merely pressing down the pawl of the ratchet with the thumb or finger, and it can be worked by either hand or foot. It is impossible for it to give away, and loosen its grasp upon the work, like a screw vise, either from hammering, jarring, or any other incidental cause. The same vise is applicable alike to all kinds of work, whether heavy or light. The extent of its grasp is limited only by the length of the rod which passes through the cam disks, and by which the power is applied.

A patent was obtained for this improvement through the Scientific American Patent Agency Jan. 22, 1867, by James S. Ralston. For further particulars address Carter & Ralston, Indiana, Pa.

Platinizing Metals.

Platinum has been formed into coins, etc., by subjecting it in fine powder as obtained by chemical treatment, to powerful pressure. It may now be melted and cast by the oxygen furnace referred to in another paragraph. There is also a method newly published, for coating other metals with a delicate film of platinum, and thus endowing them for practical purposes, with some of its most valuable properties. It is dissolved in nitro-muriatic acid, or aqua regia, forming bichloride of platinum. Of this, 60 grains are to be dissolved in one ounce of distilled water, with an equal weight of pure honey. Add ¼ oz. spirit of wine, and ¼ oz. ether, and filter the solution, if necessary, quite clear. The metallic surface to be platinized is first washed with soda and then with water, dried and finally heated not quite to redness, and plunged for a minute into the solution above described. The color of the platinum film is a neutral grayish black, sometimes showing a faint iridescence. Gold and silver are not affected by the process.

Eating Without Hunger.

This is a very foolish and injurious habit, one which almost every one is more or less subject to. Hunger is the signal which nature gives to indicate the necessity for a supply of food. When the system requires food and is in a condition to make good use of it, it will call for it in its legitimate way. There are some exceptions to this rule in certain diseased conditions, but they are very few. The digestive organs are in the best possible condition for digesting food when the sensation of hunger exists, and they can then do it far more easily, thoroughly, quickly, and with less effort than at any other time. Most people pay little attention to this; they are sure to eat whenever they are hungry, if it is so that they can, and they are just about as apt to eat when they are not, if it is convenient for them to do so or they chance to see anything which "tickles their palate." Especially is this rule—never eat unless you are hungry—violated in sickness. In acute disturbances of the system the sensation of hunger is seldom manifested for the simple reason that the system does not require food. If food is eaten at such times, as it usually is, for everybody thinks the patient will surely starve if he does not eat just so much and so often, it becomes a burden to the system which must be got rid of, for there is no use for it, and, as it will not do to let it remain in the stomach, the vital powers, which are engaged in the reparative process termed disease, are called from the work upon which they are engaged to remove the substances which are creating the disturbance. The result is that the reparative process is partially or wholly suspended; fresh operation, and a longer time will be required, (for causes of disease are added to those already in the remedial powers,) to repair damages and set the vital machinery in proper and harmonious action. Thousands of persons have been prematurely laid in their graves simply from eating heartily when the system was not in a condition to properly digest and appropriate the food. Let this rule be observed by those who desire health with all the untold blessings which always accompany it: whether sick or well, do not force food into the stomach unless there is a demand for it. No fears need be entertained of starving, for a desire for food will be manifested long before the starvation point is reached.—*Journal of Physical Culture.*

REMARKS.—Many of the "ills that flesh is heir to" are doubtless caused by over indulgence at the flesh pots. But it is questionable whether the rule of "eating when you are hungry," is the best that can be adopted. If carried into practice would it not lead to frequency, absurdity, and irregularity of meals? Would it be wise, even if you are hungry, to dine at bed-time, or breakfast whenever you happened to wake in the night? Does not experience prove that the golden rule of diet consists in regularity of hours, moderation in quantity, careful choice of edibles, complete mastication of the food?

ADJUSTABLE HANGER.—In our description of the adjustable hanger, in No. 25, Vol. XVI., the device was credited to M. T. Davidson, 84 John street, this city, who are only the agents for its sale. The patent is owned and the hangers manufactured by the American Tool and Machine Co., Boston.

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
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VOL. XVII., No. 2....[NEW SERIES.] ....*Twenty-first Year.*

NEW YORK, SATURDAY, JULY 6, 1867.

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PERSISTENCE THE ESSENTIAL ELEMENT OF SUCCESS.

How many projects calculated for the improvement of the race have been suffered to die, after receiving shape and form, will probably never be known. There are many really inventive minds which possess no quality of perseverance. They nurse the germ of a discovery or improvement into vitality until it promises to arrive at a useful maturity, and then, apparently without reason, let it die a natural or an unnatural death, without serving any useful purpose whatever. Unable to rest, they immediately conceive another idea, which in its turn is stillborn or dies in immaturity. The lack of adequate return for the labor and mind employed in these cases is not because the improvement itself is not valuable, nor because the inventor wanted confidence in its merits; it is wholly because he lacked persistence of purpose. Frequently the invention is re-invented, the improvement re-discovered, and the original discoverer sees the product of his own brain which he himself neglected, enriching and benefiting others. Where one man with energy, perseverance, persistence in overcoming obstacles, and well directed endeavor, will succeed with a comparatively unimportant and trifling invention, another with one of general usefulness and great intrinsic value will never realize either wealth or fame.

He who merely conceives an idea and thinks about it, but makes no attempt to bring it to the notice of others and to introduce it into the living, breathing world, has no right to claim any credit or reward if afterward another shall utilize what he merely dreamed about. Not that success alone should be the measure of estimation for a well directed attempt; for many who have not succeeded themselves have opened the path and pointed the way for others. Such should and do receive the credit due to their endeavors. But the possessor of a useful idea who selfishly keeps it as a plaything for his leisure hours, as a hobby on which to ride, or neglects to develope it into activity, can claim nothing justly of him who gave it life and purpose.

The career of Cyrus W. Field in his thirteen years of labor on the Atlantic cable is an illustration of the value of persistency. He, a retired merchant, peacefully settled, as he believed, for the remainder of his life, determined to attempt the great enterprise, and enlisted by his enthusiasm some other gentlemen in the project. A land line of four hundred miles with a good bridle path had first to be constructed through the wilderness of Newfoundland. This employed a force of six hundred men for two years. Then a submarine line had to be laid across the Gulf of St. Lawrence. This was once lost and had to be replaced. Then the great Atlantic line was four times broken, but amid all these discouragements, seeing his own fortune and those of others literally "cast into the sea," subjected to the discomforts of over thirty Atlantic voyages, and enduring the annoyances of loudly expressed unbelief and illy concealed ridicule, he persisted until his proudest monument is his success in the laying of the great ocean telegraph.

If the inventor has discovered a really good thing, or the mechanic made an indisputable improvement, there is no adequate reason for discouragement if the world does not at once accept his view of it. If it has merits and they are persistently and continually presented in the proper manner, it is impossible but they will attract attention. If, however, the inventor is satisfied with having perfected his improvement, and does not follow up this success by further attempts in properly introducing it, he may as well give up the career of a successful inventor. There must be persistence: first in working out into active form and palpable shape the idea; then there must be the same persistence in presenting it to the attention of others, whatever may be the discouragements and rebuffs which meet him. Without this quality the inventor is useless to others and powerless to aid himself; with it, to him all things are possible.

RIGHTS OF PROPERTY IN INVENTIONS.

"The large share which the inventions of Americans have had in promoting industrial progress throughout the world, renders the degree of effective protection given to inventors in the United States and other countries, a subject of pressing importance. It is not merely that the spirit of invention is aided just in the degree that encouragement is given to the inventor, but that any country desirous of maintaining her superiority over other countries, will find that the utmost liberality in giving effective protection is coincident with the soundest policy. If France, for instance, were to do for other branches of industry what it has already done for its art-industry, insure to the inventor a property in his invention in perpetuity: and the patent laws of England at the same time to remain unchanged, it would certainly happen in no long period of time that England would be unable to compete with France in the very commodities in which at the present time she has the indubitable superiority. By giving perpetuity to inventions, England, on the other hand, besides giving a stimulus to the national talent, would attract thousands of foreign inventions, now kept back by fees unreasonably high, taken in connection with the limitation of time during which a patent is valid. So long as England alone possessed a patent law, this law, imperfect as it was, produced a beneficial result to her advantage as compared with other countries, but so soon as other nations adopted similar, or even better laws, the patent regulations in England should have been more completely amended. On comparing the condition of industry in different nations with each other, we find that in proportion to the length of time encouragement has been given to the inventor, and to the liberality and effectiveness of the laws affording protection, the industry of such nation has progressed. Turkey, Persia, and China are without patent laws, and the industry of these countries is, as a natural consequence, very nearly in the same state it was two or three centuries ago, when England was politic enough to attract by the promise of property in inventions, the inventors of the whole world to develop their ideas on English soil."—*London American.*

REMARKS.—The writer thinks that patents, instead of being granted for a limited term, should be made perpetual. This would be convenient for patentees, and encouraging to that large class known as assignees, who generally purchase the patent from the poor inventor for little or nothing, and then grow rich by taxing the public.

The European masses have for centuries been ground down by monopolies. By means of patents for special privileges, taxes, imposts, and various legal devices, the lords, dukes, and other monopolists, have maintained a perpetual system of robbery and oppression upon the working classes, the baneful influences of which language is inadequate to describe.

If patents were made perpetual, a patent aristocracy would quickly spring up to revel upon the industries of this republican nation.

The aim of law is to benefit the whole people. Laws which burden the masses but fatten the few, are bad in principle, and should never be perpetuated.

Every citizen is bound to labor for the common good; and some philosophers say that the just reward for labor should be in accordance with the prices of bread and the severity of the work done; he to whom brain work is most suitable, receiving no more pay for eight hours' labor, than the man of muscle for the same period. But we do not endorse this theory. If patents were paid for on this principle, some of the poorest inventions would bring high prices, and some of the best only a trifle.

The object of the patent law is to benefit the people by putting them in possession of improved tools, machines, appliances, processes, and other agencies by which industry is assisted, intelligence promoted, and the comforts of life augmented. The law encourages inventors to make known their improvements by giving them brief monopolies and permitting them to tax the people. When the patent expires, the monopoly ends and the people come into free possession of the improvement.

We believe in the expediency of patent laws, but we think the world could revolve without them. We have been accustomed to attribute the stagnation of the Orientals to ignorance of revealed religion and lack of moral power. Our cotemporary thinks it is due to want of patent monopolies. True, the Celestials have no patent law, but the Chinese compass guides our patent ships, and Chinese powder thunders from our patent guns. Many of the most marvelous discoveries were achieved without the help of patent laws.—[EDS. SCI. AM.

SOURCES OF NATIONAL IMPORTANCE.

Neither extent of territory nor strength of armies and navies, alone constitute the power of nations; nor even the possession of vast deposits of the precious metals, although each of them under favorable circumstances may contribute to national importance. More important than either of these however, is population. The British empire, with an area of 3,555,092 square miles, has a population of 223,500,000. Russia with an area of 8,281,000, has 74,000,000 population. France, 546,000 square miles and a population of 44,000,000. The United States 2,819,811 square miles exclusive of Walrussia and a population of about 33,000,000. England's preeminent importance and influence is largely a consequence of the great population she controls, and the diversity of their productions. The people of every variety of climate and soil contribute to her wealth and add to her power. Outside of herself and her colonies she really requires nothing necessary to contribute to her ascendency; the resources of a world are virtually her own. Her colonies furnish her with all manner of useful material, which she manufactures and returns to them and sells to the world, while the islands known as Great Britain and her North American colonies supply food for her mechanics. Every essential element of prosperity, so far as material needs are concerned, she possesses to a greater extent than any other European nation. The main drawbacks to this independence are the wide separation of the parts of her empire and the difference in the language and customs of her people.

In these respects we excel her. Our territory is embraced in a single boundary line, and our people speak a common language. Our productions are those of the north temperate, temperate, south temperate, and torrid zones, and of every diversity of soil, situation, and climate. Our country contains every kind of metal and mineral, many varieties of useful timber, the best grain-growing lands on the globe, and a greater number of valuable manufacturing material than any other, except, perhaps, that of the British empire. Our population is increasing faster than that of any other country, and our institutions are not only liberal, but alike from one end of the country to another. Possessing these present and prospective advantages, it is difficult to conceive a limit to the future importance of the United States among the nations.

MALLEABLE CAST IRON.

For some reason, not fully clear to us, malleable cast iron has not assumed the position among the useful metals it is entitled to from its merits. There appears to be a prejudice against its use which arises from a doubt as to its strength. For resisting a transverse or a longitudinal strain it may not be equal to wrought iron in tenacity, nor to cast iron in rigidity, but in some situations it is actually superior to either wrought or cast iron and in some respects better than steel.

If cast from the proper metal and then properly annealed and softened by the process of semi-fusion, it is more homogeneous than either ordinary cast iron or steel. When these conditions exist it may even be forged and drawn under the hammer without crumbling; its tenacity is wonderful under some circumstances. The carbon is almost entirely abstracted, reducing it to the condition of nearly pure iron without, however, the fiber of wrought iron produced by hammering or rolling, which fibrous condition is sometimes an element of weakness: for instance a small gear with a large hole upon which a great strain comes, has been proved to be much stronger made of cast malleable iron than of wrought iron or steel.

A case came under our observation some years ago, where the spindle gear of a screw-cutting lathe containing only 20 teeth was broken. Between the bottom of the teeth and the hole for the spindle, the metal was less that one quarter of an inch thick. The ordinary cast iron gears would fly in pieces whenever the carriage was reversed. A blank was forged of a bar of tough wrought iron, turned into a ring and welded with a scarf weld. Of course the fiber or grain of the iron followed the circumference, and the vertical sections of the teeth were cut through it. This gear would not stand. Cast steel gears, both annealed and hardened, were tested and failed, when a gear was cast and made malleable and worked satisfactorily for many months. In another instance the wheels for a wringing machine, which connected the rollers, could not be made to stand when of ordinary cast iron. They were made of cast malleable iron and no after trouble was experienced.

It is poor economy to employ a cheaper material merely because it is cheap; but when cheapness and superiority may be combined, as is the fact with malleable iron in many cases, it is the part of wisdom to do so. It can not be doubted that malleable iron may be used for many purposes to which wrought iron and steel are now applied.

PRACTICAL MECHANICS AS VISITORS TO THE GREAT EXPOSITION.

A correspondent, alluding to the raising of funds in England to pay the expenses of practical workmen to the Paris Exposition, inquires why a similar movement here might not be feasible and advantageous. In our opinion, there is little in common between the two cases. First, England is separated from France by a very little distance and a very brief time. To go from New York to Chicago, or from New York to Boston by steamer and rail, is a much longer and full as difficult and dangerous jaunt; we are not certain but it costs more money. Compared with the trip from any part of England to Paris, a journey from this country to the same place, even if the start is made from New York or Boston, is a great undertaking.

Second, we do not think the same conditions exist in rela- to the requirements of the parties. A very large proportion of our employers of mechanics are themselves practical men, and quite a number of these have already gone to the Exposition. Our most successful mechanics—masters—are those who have raised themselves from the position of employés to employers. It is doubtful if this fact exists to so great an

extent in England. Many also of those of this country not now connected with mechanical business, whose means enable them to visit Paris, are intelligent and observant men, perhaps formerly workmen, who will not fail to note whatever may be interesting and useful to our mechanics, and give the public the advantage of their observations.

Tobacco Morality.

The characteristics of an individual are vividly portrayed in little things. An exchange in relating the traits of inner life in the workshop, alludes to the moral caliber of the men by the way they get tobacco of their shop mates, by begging, or borrowing as they are most apt to term it. One man will offer his fellow workman his tobacco box from which to help himself: another will take a bit from his box and hand it be grudgingly to his companion, and another will deny that he has any tobacco about him or perhaps that he ever uses it. One man, a Jesuit in nature if not in creed, used to keep two tobacco boxes, one he called "The World," the other "Providence." When asked for a pipe of tobacco, he would answer, "I have not a bit in 'The World;'" then calmly go off to one of the secret smoking places and light his pipe with a serene conscience. If taxed with falsehood, or asked how he had got his tobacco, "I put my trust in 'Providence,'" he would answer, and the prevarication was as good to him as truth.

OFFICIAL REPORT OF PATENTS AND CLAIMS

[Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 25, 1867.

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.

65,987.—APPARATUS FOR FORMING BUMPER CARRIERS FOR RAILROAD CARS.—W. C. Allison, Philadelphia, Pa. Antedated June 10, 1867.

1st, I claim the combination of the block, H, handled eccentric, I, blocks B and C, and the devices herein described, or the equivalents to the same, for effecting the simultaneous action of the blocks, in the manner described.

2d, The combination, substantially as described, of the bending blocks, E and E' and F and F', with the blocks, B and C.

3d, The combination of the forming blocks, E and E', with the handled eccentrics, t t'.

4th, The arrangement on each of the several forming blocks of its spindle and collar in respect to the corner of the block, as described.

65,988.—MODE OF KEEPING EGGS.—B. D. Atwell and Miss G. H. Crawford Portage City, Wis.

We claim the application of the above recipe for preserving eggs, as herein described, using for that purpose the aforesaid ingredients, or any other substantially the same, and which will produce the intended effect.

65,989.—BOLT CUTTER.—A. S. Bailey, Knoxville, Ill.

I claim the combination of the head, A, provided with the stationary cutter, a, sliding cutter, c, provided with the head, d, spring, m, and the pivoted handles, B C, having the cams, n, formed thereon, when all are arranged for joint operation as herein shown and described.

65,990.—MACHINE FOR DRESSING MARBLE.—R. P. Bailey, Niagara Falls, N. Y.

I claim the employment of a series of spring blades or scrapers, h, in combination with the clamping arms, C, and head or stock, A, for acting successively on the material to abrade it to the form of said blades, when constructed, arranged and operating substantially as and for the purpose set forth.

I also claim the arm or holder, C, when connected with the head, A, or its equivalent, by means of pivot, d, and the bearing bolts, e e, arranged to allow the blades to adjust themselves to the work when rotated in either direction, substantially as set forth.

I also claim, in combination with the blade, h, and its set bolt, k, the chamfering away of the clamp sides at i i, substantially in the manner and for the purpose set forth.

65,991.—DRILLING INSTRUMENT.—N. Barnum and G. C. Schreiber (assignors to N. Barnum), St. Louis, Mo.

1st, We claim the stock, B, with a tool cavity and tapering slots for the screw, c2, in its lower end combined with the spring, C, and set screw, c2, substantially as described and set forth.

2d, The slotted tool, c, in combination with the spring holder, C, and its set screw, c2, and the tool stock, B, when acting substantially as set forth.

65,992.—ROTARY PUMP.—J. A. Bazin, Canton, Mass.

I claim the packing, f k, constructed as described, and arranged between the wings of the pistons, substantially as set forth.

65,993.—BLIND FASTENER.—A. Bingham, Newtonville, Mass.

I claim the blind fastener as composed of the catch lever, C, the stop, D, its shoulders, h h, and the catch, E, arranged and constructed so as to be applied to a blind and a window frame or sill, substantially as specified.

65,994.—WATER METER.—E. Blakeslee, Plymouth, Conn., and J. S. Hunter, Hartford, Conn.

1st, We claim the valve, I, having the opening, a, and passages, d and e, arranged in relation to the ports in the valve seat so as to operate substantially in the manner described.

2d, In combination with the above we claim the weighted lever, k, constructed so as by its movement to reverse the flow of water, substantially as herein set forth.

3d, In combination with the above we claim the disphragm or piston, arranged substantially in the manner described.

65,995.—HARNESS SADDLE.—Valentine Borst, N. Y. City.

1st, I claim the removable hooks, C C, adapted and arranged to and with the hollow bridge or pier, B, substantially as set forth, so that the saddle can be used with or without the hooks.

2d, I also claim the use of the terrets, D D, for securing the hooks, C C, in the ends of the hollow bridge of the saddle, substantially as set forth.

65,996.—MORTISING MACHINE.—S. C. Brown, Richmond, Ind., assignor to J. A. Fay & Co., Cincinnati, Ohio.

I claim the cutter, t, shaft, p, and pulley, m, attached to the flanged plate, n, when said plate is made adjustable upon the bed plate, r, substantially in the manner and for the purpose set forth.

65,997.—HAND LOOM.—J. D. Browne, Cincinnati, Ohio.

I claim the cranks, a b, and the rod or bar, D, having a center pin, c, and the guide plate, G, in combination with the shaft, C, substantially as herein described.

65,998.—MACHINE FOR FORMING SPECTACLE FRAMES.—Chauncey Buckley (assignor to Charles Parker), Meriden, Conn.

I claim the eye former or stretcher consisting of a plunger to enter the eye and a bed for the eye to rest upon, having an opening through it of the form of the eye desired for the plunger to pass into in combination with the holding pieces, d' d'' as set forth.

I also claim the combination of the adjustable supporting plates, e, the bed and the plunger, substantially as described.

65,999.—MODE OF TREATING HYDRO-CARBON OILS.—A. M. Burke and S. Wright, Cleveland, Ohio.

1st, We claim the herein-described process of consecutively treating oils, first, by alkali in the still, as specified, and subsequently by the use of acids in the agitator as a continuation of the said process, substantially as set forth.

2d, As a means for carrying out the herein-described process we claim the valve or plug, D, provided with suitable devices for operating the same in combination with the pipe, C, and still, substantially as described.

66,000.—STEAM WATER ELEVATOR.—Martin Burton, Indianapolis, Ind.

1st, I claim the arrangement of the chambers, A and B, and pipes, G H and C, in the manner and for the purpose substantially as set forth.

2d, The arrangement of the steam induction pipe, F, water induction pipe, D, eduction pipe, L, and valves, E M and N, float, I, rod, J, and lever, K, substantially as and for the purpose set forth.

66,001.—ELECTRO MAGNET.—S. G. Cabell, Quincy, Ill.

I claim a compound magnet consisting of two or more helices inclosed in soft iron tubes with the tubes so arranged as to separate the helices and both tubes and helices arranged concentrically around a central tube or bar, as herein described.

66,002.—CORN PLANTER.—H. W. Camp and A. W. Fox, Oswego, N. Y.

1st, We claim the index, B, when constructed, arranged, and applied to machines planting in rows, for the purpose and as herein specified.

2d, The wheel, E, provided with a zigzag rim surrounding its periphery in combination with the feeding bar, F, when constructed and operating substantially as herein described.

3d, The shields, b, and gages, m, in combination with the feeding bar, F, the whole constructed and operating substantially as herein specified.

4th, The shoes, K, for removing obstructions and regulating the depth the seed is to be planted in combination with the hollow teeth, p, and roller, P, when constructed in the manner herein set forth.

5th, The ratchet teeth with pawl, d, and cone, c, in combination with the driving wheel, A, index, B, and wheel, E, when these several parts are arranged and operating substantially as herein specified.

66,003.—CALENDAR CLOCKS.—C. M. Clinton and L. Mood, Ithaca, N. Y.

1st, We claim the twenty-four-hour escape made by the segmentary wheel, A, segment, B, and arm, C, when substantially made as described.

2d, We claim, in combination with the arm, C, the use of the eye, D, or its equivalent, acting in a variable and changeable space, between the nuts or bars, E and F, or their equivalents, both for the purpose of holding and adapting our various devices to each other and to allow a constant movement of our time escape-arm, C, while the rod, G, moves different or diverse distances according to the variable length of the months of the year, and also for adjusting the calendar and clock works to each other, as set forth.

3d, We claim the springs, I and H, acting on the correcting rod, G, and the segment, B, either one or both for preventing contingent or unintentional changes or displacements, and yet allowing the changes to be made by the mechanism of the clock and calendar at their appropriate times, as described.

4th, We claim the combination of the spring I, with the rod, G, as described, for the purposes of retracting the said rod or rods and its connecting parts and operating the calendar correctly through our other devices be the position of the clock and calenear what it may; and also for the purpose of obtaining a complete or supplementary driving power for our calendar, as described.

5th, We claim gearing the month cylinder into the month wheel either directly or by intermediate cog wheels, as described.

6th, We claim the vibratory shaft and cog wheel, or any similar device, and the gearing the same in any manner with the thirty-one-day wheel or days of the month device, when so made as to revolve the days of the week cylinder one or more days space, as described.

7th, We claim putting or making the cam for throwing out of gear the vibratory shaft and its cog wheel on the weight lever or cross bar of the thirty-one-days wheel, and we claim the detent, Y b, for holding the said cog wheel and its connected parts fast while out of gear; and we claim the gearing of the day of the week cylinder into the vibratory device; the whole of these just named parts as a combined whole or each acting separately by itself, as described.

8th, We claim the fixed stop, N, for checking the upward motion of the weight lever or cross bar by the pawl or dog, M, or other convenient part connected with the said lever or bar, as described.

9th, We claim making our registers or cylinders of calendar clocks either wholly or in part of paper, or other similar light material, for the sake of their lesser weight and strain on the mechanism of the calendar, as described.

10th, We claim the specific device of a month wheel made by the variable depth of teeth, Ua Ub Uc and Ud, to accomplish every possible monthly change reasonably requisite in a calendar clock, as figured and described.

11th, We claim the device of putting the month wheel in direct communication with the thirty-one-days wheel shaft or any part or portion of the thirty-one days wheel or shaft, as described.

12th, We claim placing the month escape cam on the shaft of the thirty-one-days wheel so that one tooth or month of the month wheel escapes in every revolution of the thirty-one-days wheel.

13th, We claim a wheel cam or escape so made and operated as to act as a stop or detent to the month wheel and yet allow at the proper time that wheel to revolve as described, and also the making of an additional length of teeth to the teeth of the month wheel so as to fit and embrace the said cam or escape, as described.

14th, We claim the hinged lever, substantially made as described, and operating so as to produce the described results on the month wheel and escape detent of the thirty-one-days wheel on either one or both of the said parts, as described.

15th, We claim the employment or use of a hinged lever on the shaft of the thirty-one-days wheel when accomplishing any one or all of the purposes described.

16th, We specifically claim the shoe-shaped and convex cams, one or both on the end, T, of the hinged lever, as described.

17th, We claim centering and connecting the devices of the hinged lever, R, the cam or escape, Va, of the month wheel, the month wheel, U, the vibratory arm and cog wheel, Y, and through the said month wheel and said cog wheel, the month and the day of the week cylinders, immediately with the axis, V, of the thirty-one-days wheel or that wheel itself, as described, thus simplifying and making more compact our calendar.

66,004.—GAS APPARATUS.—Charles Deavs, New York, N. Y.

1st, I claim the use of two or more retorts connected together in pairs so that the first shall volatilize the oil or oily substance, and the second shall complete the conversion thereof into a fixed gas suitable for illuminating purposes, the said retorts being constructed and arranged substantially as and for the purpose herein above set forth.

2d, The combination with the conductor pipe, K, of a cooling trough, L, the water from which supplies the wash-box, substantially as and for the purpose set forth.

3d, The combination with the discharge end of the conductor pipe, K, of a perforated or reticulated disk, h, substantially as and for the purpose set forth.

4th, The combination with the oil reservoir, U, and retorts, B, B', of a cut off, y, constructed and operated substantially as herein described.

66,005.—WINDOW SCREEN.—R. G. Dennell, Saco, and Liberty B. Dennell, Portland, Maine.

We claim the combination of the cylinder, g, pin n, and pins, h, h, or their equivalent, i, cavity, v, spring, f, rotary cylinder, k, cog, m, groove, n, pin, w, and mortise, y, when constructed and operating in the manner and for the purposes specified.

66,006.—BOAT DETACHING APPARTUS.—Wm. A. Devon, Port Richmond, N. Y. Antedated June 11th, 1867.

I claim, first, the construction and application of the jointed hooks attached to the boat by an extended shank, in combination with the slides, g, and interposing springs, arranged and operating substantially as specified.

2d, The arrangement at opposite ends of the boat of detachable spring-hooks, constructed substantially as described, in combination with rod, rope or chain connections within the boat whereby they may be operated in unison to unlock the slides that secure the hooks in their closed condition, essentially as herein set forth.

66,007.—ANIMAL TRAP.—J. P. Emswiler, Knightstown, Ind.

I claim in a rat trap the combination of devices for disengaging the shaft, C, and actuating the fingers, K, and doors, D and F, substantially as described.

2d, The combination of the revolving fingers, K, shaft, C, eccentric, C1, rod E, and door, F, substantially as described.

3d, The combination of the revolving fingers, K, shaft, C, eccentric, C2, rods, D1, and doors, D, substantially as and for the purpose set forth.

4th, In combination with the revolving shaft, C, and fingers, K, and automatically acting door, F, opening into the upper chamber, I claim, the door, L, opening into the lower chamber, substantially as and for the purpose set forth.

66,008.—FARM GATES.—J. W. Epperson, Woodhull, Ill.

I claim, first, the spur wheel, E, operating substantially as described,

2d, The grooved rail, D1, of the gate, D, in combination with the spur wheel, E, and the revolving wheels, C, attached to the fence posts and upon which the gate slides on opening and closing.

3d, In combination with the gate, D, with horizontal rail, D1, and vertical strips, D2, I claim the spur wheel, E, shaft, E1, and winch, F, arranged to operate substantially in the manner and for the purpose set forth.

66,009.—DIES FOR SWAGING AND PUNCHING THE JAWS OF WRENCHES.—J. S. Farnsworth (assignor to E. G. Lamson,) Windsor, Vt.

I claim the combination of dies and punch, constructed and operating substantially as described.

66,010.—CURTAIN FIXTURE.—M. R. Fenton, Washington, D.C.

I claim, first, the hinges, A, A, in combination with bar, C, and roller, D, substantially as and for the purpose specified.

2d, Hinges, A. A., pulley, J, cords, s and n, and roller, D, combined and operating in the manner and for the purpose substantially as herein described.

66,011.—APPARATUS FOR BORING CYLINDERS.—L. B. Flanders Philadelphia, Pa.

I claim, first, the combination of the boring bar, B, the casing, I, its train of wheels herein described, or the equivalent to the same, the nut, w, and the stationary feeding screw, G, the whole being arranged and operating substantially as described.

2d, The cog-wheel, q, its circular recess and grooves, t, t, in combination with the hollow spindle, r, and the rod, s, with its pin, s1, and spiral spring, u, the whole being arranged and operating substantially in the manner and for the purpose set forth.

3d, The bearing, E, in combination with the adjustable and conical split ring, g, and ring, g1, or its equivalent, the whole being constructed and arranged substantially as described.

4th, The split ring, b, in combination with the bearing, E, as and for the purpose described.

66,012.—SIDE-HILL PLOWS.—P. H. Flansburgh, Eden Township, Cal.

I claim, first, the two plates, C, C1, placed side by side and operating independent of each other, either by a hinge or rack and pinion, substantially as herein described.

2d, The levers, H and H', with the toothed segments, G and G', operating the plows by means of the independent vertical racks, E and E', substantially as and for the purpose described.

66,013.—BLEACHING.—J. B. Fuller, Norwich, Ct., assignor to self, J. P. Upham, Claremount, N. H., and E. T. Rice, New York.

I claim, first, the method herein specified of subjecting the fabric or fibers to the operation of elastic squeezing rollers, to produce a circulation of the bleaching liquid throughout the fibres of the fabric, substantially as set forth.

2d, The method of utilizing the chlorine gas contained in the fabric or fiber after it has been squeezed by elastic rollers by immersing the same in water, as set forth.

66,014.—CHUCKS FOR IRON PLANING.—M. C. Gardner, Rochester, N. Y.

I claim the sliding jaws, B, B, and the bracket or support, D, back of one of the jaws, B, B, to chuck lengthwise the table and at the same time using the jaws, B, B, for chucking both crosswise and lengthwise the whole table, in combination substantially as specified and for the purposes set forth.

66,015.—CHURNS.—J. C. Gaston, Cincinnati, Ohio.

I claim the guard chamber, C, having one or more openings, c, in its side wall, b, substantially as shown and described.

66,016.—PLOWS.—Lewis Gibbs, (assignor to Bucher, Gibbs & Co., Canton, Ohio.

I claim uniting the bar, A, to the share, B, at the point, s, underneath the share, as and for the purpose herein described.

I also claim a clevis made in two parts, with dovetailed recesses cast therein, so as to fit a dovetail or shoulder formed on the end of the beam and united thereto by a bolt or key, substantially as herein described and represented.

66,017.—SPINDLES FOR SPINNING.—A. H. Gilman, Hopedale, Mass.

I claim the application of the step cap, C, to the spindle, A, by means or devices, such as when the cap may be encompassing or covering the step, and the spindle may be in revolution, shall not only cause the cap to be revolved with the spindle, but allow it, the said cap, to be freely raised off the step in order to enable such step to be supplied with oil as occasion may require.

I also claim the combination and arrangement of the collar, D, with the spindle, A, and the cap arranged with a step as set forth, the collar being for the purpose or object as explained.

I also claim the arrangement of the collar, D, and the stud, d, with the stud and applied to a step, B, substantially as described.

66,018.—BOILER-FEED-WATER REGULATOR.—C. H. Gould, Cincinnati, Ohio.

1st, I claim the reciprocating rotary shaft, C, traversing the boiler side within a suitable horizontal sleeve, a, and provided with a float, F, inside of the boiler, and adjustably weighted lever, I, outside of the boiler, in combination with the adjustable rod, K, and valve guarded water supply pipe, substantially as set forth.

2d, I claim the arrangement of rod, K, bossed cap, P, diaphragm, N, and water supply pipe, Q, for the purpose described.

3d, The oblong float, F, stem, E, reciprocating rotary shaft, C, sleeve, A, with steam tight joint or joints in combination with the rod, K, and diaphragm stop, N.

66,019.—SORGHUM EVAPORATOR.—W Hanson, Willoughby, O.

1st, I claim the employment of the partitioned tank, M, provided with stop-cocks and hose, P and P', in combination with the evaporating vat, K, auxiliary fire-box, I, dampers, X, X, constructed with turned up edges, Y, Y, Y', arranged and operating as and for the purpose specified.

2d, The framed bars, C, constructed as described, and connected together in sections by free joints, R, and provided with levers, T and T', in combination with the evaporating vat, K, provided with ledges, L, operating as and for the purpose set forth.

3d, Constructing the body of the evaporator with a main fire-box, E, at its front end, a wide and gradually contracted fire chamber, H, and auxiliary fire-box, I, arranged and operating as specified.

4th, Providing the main fire-box, E, with elongated draft openings, F, F, F, through the bottoms thereof, and with brick lined intermediate spaces between said openings, so as to operate as and for the purpose herein stated.

5th, The use of extended lever arms, U, U', located as shown, in fig. 1, and operating the drain gates, V, V', in the manner specified in combination with the evaporating vat, K, as set forth.

66,020.—MACHINE FOR BEATING AND PICKING COTTON.—David Harding, Lowell, Mass.

I claim the cylinders, O, N, R, armed with teeth as described, in combination with the main cylinder, C, the several parts being constructed and arranged as and for the purpose set forth.

66,021.—TORCH FOR LIGHTING GAS.—Wm. Edwin Heath, Pembroke Terrace, Great Britain, assignor to J. W. Bartlett, New York city.

1st, I claim the construction of the double case or cover having the perforated tubes, A and B, arranged one within the other, for the purpose and substantially in the manner set forth.

2d, The double handle, G, adapted either for burners constructed as shown in figure 3, or for ordinary gas burners, for the purpose and substantially in the manner set forth.

3d, The apparatus consisting of the tubes, A and B, cap, D, lamp, C, and socket, F, constructed and combined for the purpose and substantially in the manner set forth.

66,022.—ABDOMINAL SUPPORTERS.—William Henderson and J. Greenawalt, Pittsburgh, Pa.

We claim securing the end of the wire, L, by means of a spring catch, b, attached to the front plate, A, and operated by the knob, K, in the manner herein shown and set forth.

66,023.—DEVICE FOR CLOSING BOTTLES.—Conrad Herman, Baltimore, Md.

I claim the hinged clasp, A, fastened by means of the lugs, a, and screw, b, and having upright arms, d d', with the cover, B, pivoted to d', and fastened to d, by means of the lugs, o n, and screw, t, when arranged to operate substantially as described and set forth.

66,024.—LIME KILN.—Chas. Hinkley, Williamsville, N. Y.

I claim the combination and arrangement of the elliptic cupola, A, the inwardly widened furnaces, B B, sharp-edged pillars, h h, and flues, e e, as and for the purpose herein specified.

66,025.—PETROLEUM GAS BURNERS FOR HEATING PURPOSES.—D. S. Holden, New Orleans, La.

I claim a gas retort and burner, consisting of the concentric or annular oil chamber, C, in combination with a central air chamber or flue, B, provided with perforations, D', at or near the top of chamber, C, substantially as and for the purpose described.

66,026.—MACHINE FOR CLEANING MOSS.—Henry Hull, Pattersonville, La.

I claim the vibrating convex card, A, in combination with a fixed concave card, C, when the teeth of both project in the same direction and at the same angle as described for the purpose set forth.

66,027.—FIELD FENCE.—Marshal Ingersoll, Elyria, Ohio.

I claim the fence constructed and arranged in the manner and for the purpose substantially as specified.

66,028.—HYDRAULIC PRESSURE REGULATOR.—Isaac Judson, New Haven, Conn.

1st, I claim the combination of the two diaphragms, with the valve and its stem, when they are constructed, arranged, and fitted for use substantially as herein described and set forth.

2d, The combination of a ring or annular disk with either of the diaphragms when used to lessen the extent of the yielding surface of the diaphragm, substantially as herein described and set forth.

66,029.—POTATO DIGGER.—G. W. Kintz, West Henrietta, N. Y.

1st, I claim the double-winged mold-board plow, provided with the adjusting slats, b, and flaps, a, arranged and operating in the manner and for the purpose set forth.

2d, The combination and arrangement of the adjustable combs, D, with the double-winged slatted mold board, C, operating in the manner and for the purpose specified.

3d, The employment, in combination with the double-winged slatted mold board, of the rollers, e e, situated in the ends of the handles, as set forth.

4th, The combination with the double-winged slatted mold board of the shaker, composed of the plates, I, vibrating arms, o, and axle, G, with cogs, n, and the adjusting braces, L, as set forth.

5th, The employment of the pivoted vine puller, P, with ratchet rod, Q, so arranged as to operate from the rear for discharging the vines as herein set forth.

6th, The arrangement of the machine as a whole, consisting of the slatted mold board, C, combs, D, shaker, I I G L n o o, and vine puller, P Q, as herein set forth.

66,030.—ADJUSTABLE TIRES FOR WHEELS.—D. J. Kirkman and E. H. Gray, Winchester, Ill.

We claim, 1st, The cap, C, when constructed substantially as and for the purpose set forth.

2d, The shoe, D, when constructed substantially as and for the purpose specified.

3d, The cap, C, and shoe, D, as constructed in combination with bolt heads, e e, and screw bolt, d, substantially as and for the purpose described.

66,031.—PLOW.—D. J. Kirkman and E. H. Gray, Winchester, Ill.

1st, We claim the employment of a subsoil plow, F, when attached to the adjustable bar, m, said bar being constructed and arranged in the manner herein specified.

2d, The adjustable bar, m, double jointed arm, h, and hook, i, the whole combined in the manner and for the purpose set forth.

66,032.—NAIL EXTRACTOR.—A. Marden and A. H. Burgess, Philadelphia, Pa.

We claim the jaws, D D, when constructed with slightly tapering sides, hinged together at the top and having an intervening spring, which jaws rest in a corresponding tapering mortise, B, in the handle, A, and operate together in the manner substantially as described and for the purpose specified.

66,033.—MEAT CUTTER.—Wm. M. Miller, Tulpehoccan, Pa.

I claim the block, S, and spring arms, K, in combination with the screw nut, Y, and in the manner and for the purpose specified.

66,034.—BEAN PULLER.—S. W. Moore, Albion, N. Y.

1st, I claim the combination of the fixed and sliding bars, b f, armed with intermatching teeth, g' g', operating substantially as and for the purpose herein set forth.

2d, Hinging or jointing the teeth, g', in the manner and for the purpose specified.

3d, The employment of the guides or shields, i, in combination with the sliding bars, f, for the purpose set forth.

4th, The arrangement of the treadle P, rod, Q, pawls, m, and ratchet wheels, n n, in combination with the disks or cranks, M, connecting rod, L, and arms, H, operating to adjust and retain the roller, as herein set forth.

66,035.—BOOT CRIMPER.—Dewitt C. Mowrey, Milford, Mass.

I claim the combination and arrangement of the auxiliary jaws, with the clasp, the frustum, and straining screw.

I also claim the application of the auxiliary jaws to the clasp by means substantially as described, viz: by the arms provided with ears and by slots, having the supports arranged as set forth.

66,036.—MUCILAGE BOTTLE.—A. M. Olds, New York City, assignor to J. W. Hawxhurst. Antedated June 12, 1867.

I claim constructing and arranging, in connection with a bottle, an upright adjustable brush operating through its cap, substantially as and for the purposes herein set forth.

66,037.—EVAPORATING PAN.—S. Page, McAllisterville, Pa.

1st, I claim the adjustable plate, D', arranged as herein described, and employed to vary the size of the flue beneath the receiving or skimming pan, in the manner and for the purpose specified.

2d, I claim the combination with the finishing pan, G, and chamber, H, of the dampers, I J, arranged and operating in the manner and for the purpose set forth.

66,038.—GYMNASTIC SWING.—Alonzo P. Payson, San Francisco, Cal.

I claim a swing constructed with the supporting arms, C C, and the motive levers, E F, substantially as and for the purpose described.

66,039.—GANG PLOW.—J. C. Pfeil, Arenzville, Ill.

1st, I claim the lever, a, having the cam, e, attached and arranged to operate in combination with the tongue, C, and beams, B and B', as shown and described.

2d, Constructing the crank axles, E, with a tubular portion to fit on the end of the wooden axle, A, as shown and described.

66,040.—BURGLAR ALARM.—Charles E. Pierce, N. Y. City.

1st, I claim the lever, d, with projection, f, and indicating plate attached when arranged as and for the purpose set forth.

2d, The guards made up of the parts, n o and q q, or their equivalents, operating as described.

3d, In combination with the guards as described, the slotted plate, m', and knob, p, for the purpose set forth.

4th, The forked lever, r, in combination with the window guards as described.

5th, In combination with the alarm movements the case or cover with openings as described.

6th, The catch lever or keeper, b, in combination with the center wheel, c, and the detent arm, as described.

7th, I claim so arranging the guard bolt that by means of cords or wires connected therewith, an indicator plate is raised at the same time the alarm is given.

66,041.—METHOD OF MAKING ILLUMINATING GAS.—Alonzo C. Rand, Union Mills, Pa.

I claim the combination of the tanks, A1 and A2, with the gas holder, J, operated substantially as and for the purposes herein described.

66,042.—CHURN.—James H. Roundey (assignor to himself and Amos H. Roundey), Obltown, Me.

1st, I claim the double vibrating dashes, b b, when constructed and arranged to operate in manner substantially as and for the purposes specified.

2d, The arrangement of churn, A, the double vibrating dashes, b b, and the vibrating levers, B B, driven by crank, D, or its equivalent, all arranged to operate in manner substantially as described and shown.

66,043.—REIN HOLDER.—J. Scott Russ (assignor to W. N. Zimmer, and W. W. Coggshall), Rensselaerville, N. Y.

I claim the rein holder, A A, having a T-shaped tongue, constructed substantially as herein set forth.

66,044.—LIGHTING AND EXTINGUISHING GAS BY ELECTRICITY.—E. P. Russell, Manlius, N. Y.

1st, I claim the supplemental gas cock, S, attached to the main pipe, L, when opened and closed by clockwork, substantially as described, for the purpose of lighting the main burner, M.

2d, Also the jet, T, for burning off the match, substantially as and for the purposes set forth.

3d, Also the lever, U, in combination with gas cock, S, substantially as and for the purposes set forth.

4th, Also the wire, V, substantially as and for the purposes set forth.

5th, Also the spring arms, O, substantially as and for the purposes set forth.

6th, Also the revolving inclined friction plate, Q, constructed and operating substantially as and for the purposes set forth.

7th, The springs, P, in combination with the perforated arms, O, for the purpose of holding the matches in the position described.

8th, Also the screws, F F', in combination with the bolts, J J', and arms, H', substantially as and for the purposes set forth.

9th, The combination and arrangement substantially as described, of the main spring, K, gas cock, N, and arms, H' and O, for the purposes set forth.

10th, The hands, D D', arranged and operating as described, in combination with step shaft, E, hollow shaft of worm, F, and thumb screw, I.

11th, Also operating the jet cock, S, by means of the fuse itself, substantially as and for the purposes set forth.

12th, Also placing the matches so as to revolve horizontally, substantially as and for the purposes set forth.

66,045.—CLOTHES DRYER.—E. D. Sanford, Baltimore, Md.

1st, I claim the revolving rack, composed of the tubular sliding box, I, collars, J J', rods, K, supporting ropes, O, and clothes lines, P, or their equivalents, when constructed and operated substantially as and for the purpose described.

2d, In combination with the sliding rack of a clothes dryer, I claim the weighted box, Q, constructed and employed substantially as described for the purpose specified.

3d, The arrangement of the rack, I J J' K O P, post, A, socket, B, bed frame, C, and braces, D, with the rope, N, loops, M, weight, Q, and pin or hook, L, combined and operating substantially as and for the purpose set forth.

66,046.—CUT-OFF VALVE.—I. M. Scott and W. R. Eckart, San Francisco, Cal.

1st, I claim the movable plates on partitions, n n', arranged between and in contact with the main valve, c, and cut-off valve, C, substantially as described.

2d, The screw, J, and spindle, h, together with the wheels, k m o, and the yoke, p, arranged for disengaging the plates, n n', from the action of the governor, substantially as described.

66,047.—HARVESTER PITMAN.—T. C. Sebring (assignor to Ira A. Hebbard), Rochester, N. Y.

I claim the automatic take-up, constructed substantially as described, being composed of a spring, s, and taper key, k, plug, C, and boxes, B and B', substantially as described.

66,048.—TOY PISTOL.—Benjamin Sherwood and Daniel Fitzgerald, New York City.

1st, We claim the lever, D, provided with a follower, C, on one end, and used in combination with the curved barrel and trigger, E, as and for the purposes specified.

2d, The combination of the rubber set in the socket, F, with the curved barrel and lever, D, as and for the purpose specified.

3d, The curved barrel, A, when used in combination with a follower which does not operate outside of the rear of the barrel, but which operates upon the ball or missile to be sent around the curve in the barrel, as and for the purpose specified.

4th, The form of the trigger, E, adapted to be laid in between the two halves of the pistol, and not to need fastening.

66,049.—WAGON.—S. W. Slocumb, Albany, Ill.

1st, I claim the circular bearing, C, in combination with the hub, D, when constructed substantially as described.

2d, The combination of the circular bearing, C, hub, D, plate, E, and ring, F, substantially as described.

3d, The circular bearing, C, when attached eccentrically to the axle, and in front of a line passing through the center of the wheel, substantially as described.

4th, The arrangement of the bolsters, H, when placed in rear of the axle, and the axle when placed in front of a line passing through the center of the wheels, substantially as described.

66,050.—GRAIN MEASURE.—Harlow C. Smith, Chicago, Ill.

Antedated June 22, 1867.

I claim a half bushel or similar grain measure, having its bottom composed of the stationary part, A, and the hinged portion, B, and provided with the spring hooks, D, or their equivalents for attaching the bag, all constructed and arranged to operate as shown and described.

66,051.—WRENCH.—Isaac H. Smith, Albany, N. Y.

I claim the adjusting screw, E, with flatted or concave side or sides, a a' a'' a''', or their equivalents for the purpose set forth, substantially as described.

66,052.—UNIVERSAL JOINT.—R. T. Smith, Nashua, N. H.

I claim the combination of stirrups, B and C, with their bearings, d d, and e e, swinging on the intermediate shaft, g, on which shaft an intermediate cog wheel or cog wheels, or pulley or two pulleys, may be placed, essentially as represented in the accompanying drawings.

66,053.—BUTTONS.—J. R. Spooner, Lowell, Ohio.

I claim the button fastening above described composed of the bent plate, A A' having the teeth, a a a a, and the button, B, attached to it, substantially as and for the purpose described.

66,054.—LIGHTNING ROD INSULATOR.—Darius Stebbins (assignor to himself and E. Morse), Wallingford, Conn.

I claim an insulator constructed substantially in the manner described, so that the rod may be secured directly from the interior of the insulator, as and for the purpose specified.

66,055.—ADVERTISING MACHINE.—I. W. Sylvester, New York City. Antedated June 15, 1867.

I claim, 1st, The application to advertising of an endless curtain made to revolve automatically, at given intervals quickly so as to attract attention by its motion, and then slowly so as to be apparently motionless and to allow of the easy reading of the advertisements.

2nd, The device whereby the power moving the curtain is retarded at regular intervals by means of the arm, J, notching into, passing through and being relieved from the periphery of the clock wheel, substantially as herein described and set forth.

66,056.—SIGNAL FOR RAILROADS.—E. H. Tobey and Copley A. Nott, Watertown, N. Y.

I claim, 1st, The combination of the sliding signal box or other signal device with the mechanism for rotating the same in a horizontal plane in such manner that the said device when raised or elevated to a certain point in the signal frame shall be thrown in gear with said mechanism as and for the purpose herein described.

2nd, The combination of the signal device, capable of a sliding and rotary movement as described with the mechanism for imparting the rotary movement under the arrangement herein described so that the position of the said signal device when in gear with the said mechanism shall be determined by the position of the switch with which the mechanism is connected as and for the purpose set forth.

3d, The combination with the reflector box and its frame, and actuating mechanism of a day signal actuated by said mechanism in the manner and for the purposes set forth.

4th, The combination of the reflector box or other signal device and its sliding frame with the guide rods upon which the said frame is mounted and held, substantially as and for the purposes set forth.

66,057.—BED BOTTOM.—Asa M. Tomb, Lyons, New York.

I claim, 1st, The reversible buckle, V, furnished with hook head at the end of each bar and with the hook, a, for securing on either side of the rail as described.

2nd, I claim the hollow fastening to the bed rail or to a piece of wood attached to the bed rail as shown at fig. III in combination with the reversible buckle and pin.

66,058.—FIRE ESCAPE.—J. Wagner and J. Schmid, Philadelphia, Pa.

1st, We claim in elevators and fire escapes the lattice frames in combination with the jointed racks, D D' the operating pinions, E E' and the take up cylinders, F F', the same being arranged to operate together substantially as described for the purpose of elevating and giving stiffness and steadiness to the lattice frames when in use.

2nd, We also claim in combination with the lattice frames, A, of an elevator and fire escape the friction wheels, G, and the bearing posts, H, arranged to operate together substantially as described for the purpose of giving additional stability to the lattice frames when elongated as described.

66,059.—DOOR LOCK.—W. P. Wentworth, Detroit, Mich.

I claim the slot, B, in the bolt, A, in combination with the inclosed tumblers or pallis, O, operating as set forth.

66,060.—SODA AND MINERAL WATER STAND.—C. M. Welden, Pittsfield, Mass.

I claim, 1st, A soda and mineral water stand with one or more transparent sides, substantially as and for the purpose described.

2nd, The double flanged corner-pieces, c, in combination with the transparent plates, B, forming the sides of the stand, A, substantially as and for the purpose set forth.

3d, The tubular packing pieces, d, in combination with the transparent plates, B, and corner pieces, c, of the stand, A, constructed and operating substantially as and for the purpose described.

66,061.—CAR COUPLING.—J. F. Wotring, Willey, West Va.

I claim, 1st, The combination of the hinged bar, B, hinged pin, C hinged guide, D, substantially as and for the purpose described.

2nd, In combination with the pivoted pin, C, which is allowed to swing freely about a pivot, c, I claim the recessed guide block, D, for guiding the pin, C, and link, G, substantially as described.

3d, The construction of the block, D, with side jaws, g g, and a groove, g' substantially as and for the purpose described.

4th, The manner substantially as herein described of ensuring the proper relation of the link to the pin and of coupling two cars together when such cars are moved toward each other, as set forth.

66,062.—FIRE-PROOF SAFES.—E. H. Ashcroft, Lynn, Mass.

I claim, 1st, In a fire-proof safe the combination of a water space or chamber, d, with the pipes, i, leading therefrom and surrounding the door constructed and operating in the manner shown and as set forth.

2nd, In a fire-proof safe a lining of felting, b, or the equivalent thereof, for the purpose specified.

3d, In a fire-proof safe the combination of a water chamber with a safety plug, or its equivalent, for the purposes set forth.

66,063.—GAGE FOR STEAM GENERATORS.—E. H. Ashcroft, Lynn, Mass.

I claim the combination of the valve rod, h, with the valves, I and J, and with the inlets, A and B, and glass tube, C, constructed, arranged and operating in the manner substantially as shown and described and for the purpose set forth.

66,064.—POTATO DIGGER.—L. A. Aspinwall, Albany, N. Y.

I claim, 1st, The construction of the separators having three rows of fingers in their horizontal range.

2d, The direct connection of the separators with the cranks.

3d, The employment of the roller.

4th, The combination of the roller with the fork.

5th, The bent lever, T.

66,065.—FASTENING THE ENDS OF COTTON TIES.—Arthur Barbarin, New Orleans, La.

I claim the device, A, when constructed as herein described for the purpose set forth.

66,066.—GAS CARBURETOR.—J. A. Bassett, Salem, Mass.

I claim, 1st, A gas carbureting chamber surrounded by the casing of iron or other fire proof material, substantially in the manner shown and for the purpose set forth.

2d, A gas carbureting chamber having the inlet for hydro-carbon and waste exit arranged substantially as set forth.

66,067.—APPARATUS FOR CARBURETING AND REGULATING THE FLOW OF GAS.—J. A. Bassett, Salem, Mass.

1st, I claim a regulator in combination with a closed carburetor so as to regulate the flow of gas after being carbureted without risk of leakage, substantially as described.

2d, The construction of a gas regulator substantially as shown and described.

3d, Retaining the diaphragm, H, in place and the gas joint made at the flanges, substantially as specified.

4th, A diaphragm prepared with the composition described or its equivalent when used for this purpose substantially as set forth.

5th, A diaphragm composed of two or more sheets of flexible material enclosing a sheet of malleable metal in the manner and for the purpose as shown and described.

66,068.—CARBURETING GASES.—J. A. Bassett, Salem, Mass.

I claim, 1st, The arrangement of a hydro-carbon reservoir above and connected with a carbureting chamber either with or without capillary, substantially as set forth.

2d, The overflow receptacle connected with the carbureting chamber for the purpose set forth.

3d, The process of carbureting gases for illumination by the method, substantially as specified.

66,069.—MODE OF CARBURETING GASES FOR HEATING AND ILLUMINATION.—J. A. Bassett, Salem, Mass.

I claim, 1st, The process of charging gases with the vapor of atomised hydro-carbon fluids for illuminating and heating purposes, substantially as set forth.

2d, The apparatus as shown and described with the several parts or their equivalents when used for this purpose for carbureting air or gases for illuminating and heating purposes in the manner substantially as set forth.

66,070.—MANUFACTURE OF ILLUMINATING GAS.—J. A. Bassett, Salem, Mass.

I claim, 1st, The process herein described for the manufacture of illuminating gas, which process consists in charging a mixture of coal gas or its equivalent and air with the vapor of any suitable hydro-carbon liquid, substantially as described.

2d, The improved illuminating gas made substantially as set forth.

66,071.—MANUFACTURE OF ILLUMINATING GAS.—John A. Bassett, Salem, Mass., assignor to John H. Irwin and Isaac Simmons.

1st, I claim the manufacture of an illuminating gas from the vapor of gasoline or other volatile hydro-carbon liquid, when the apparatus used is placed above the point of combustion, and so arranged that the gas is distributed to the burners by its own gravity.

2d, I claim a series of two or more pans or receptacles for oil, B B, so arranged one above another within the case, A, as to produce a large carbureting surface, and at the same time admit a current of air to pass automatically down over the surface of the oil in the pans, substantially as and in the manner set forth.

3d, I claim the combination of the pipe, F, and case, A, when so connected that the oil flowing over into the bottom of the carburetor will stop the passage of the gas into the pipe, F, and thereby extinguish the lights before the oil will flow down said pipes.

4th, I claim in combination with inlet for air, D, the pipe, G, when arranged and operating substantially as and for the purpose set forth.

66,072.—CONSTRUCTION OF FIRE-ARMS.—John E. Blake, Norwich, Conn.

I claim the fire-arm constructed as described, and provided with notches, e f and g, in the stock, arranged in relation with each other to form the bearings for the trunnions of the hammer and trigger, and for the heel of the spring, as shown and described.

66,073.—SHOE STRING FASTENER.—William G. A. Bonivill, Dover, Delaware.

I claim the combined fastening, A I, arranged to operate substantially as and for the purposes set forth.

66,074.—HAY SPREADERS.—George E. Burt, Harvard, Mass.

1st, I claim the forks, f, when so operated as to revolve around a common centre, and at the same time to have an oscillatory motion communicated to them by the positive action of mechanism by which their points shall be thrown forward with an accelerated motion when acting upon the hay, and be retracted when throwing off the hay, substantially in the manner set forth.

2d, So arranging the revolving shaft, L, that it shall pass eccentrically through the dead centre, U and receiving motion from the wheel, W, through the pinion, P, shall communicate it to the fork, f, substantially in the manner set forth.

3d, The combination of the shaft, L, placed eccentrically to the centre of the rotating heads, b, with the arms, d, shafts, a, and forks, f, substantially in the manner set forth.

4th, The balancing of the tedder by the rake, substantially as described.

66,075.—STEAM DRYING CYLINDERS.—H. W. Butterworth, Philadelphia, Pa.

1st, I claim the standard or bearing, B, with its chamber, b, and opening, t, in combination with the tubular spindle, A, projecting into the said chamber a packing ring, i, and follower, D, or its equivalent, the whole being constructed and arranged substantially as and for the purpose described.

2d, The combination of the follower, D, and a screw stud turning in the follower and projecting through stand, substantially as and for the purpose set forth.

66,076.—DUMPING WAGONS.—Nich. Clute, Schenectady, N. Y.

I claim the plates on the bed frame, in combination with the rollers connected to the body or movable frame or their equivalents, substantially as described.

I also claim the stops at the rear end of the moveable frame, provided with catches to lock it to the bottom frame, substantially as described.

I also claim in combination with the plates and rollers above claimed the crank shaft, pinion and rack fastened to the movable frame.

66,077.—CANS AND PAILS FOR HOLDING PAINT.—Frederick W. Devoe, New York City.

I claim the hooked tongues, C, arranged at the upper edge of the pail or can and in relation with the cover, B, thereof, substantially as herein set forth for the purpose specified.

66,078.—MACHINE FOR SHRINKING TIRES.—Daniel Ellenwood, Jr., Garrettsville, Ohio.

I claim the frame, A, yoke, B, flange, F, in combination with the adjustable shoulder, D, for the purpose and in the manner specified.

2d, Levers, I, cams, K, as arranged and operated by the screw, H, and adjustable nut, J, in combination with the frame, A, shoulder, D, flange, F, and yoke, B, for the purpose and in the manner as set forth.

3d, Sections, c and b, in combination with the flange, F, and shoulder, D, for the purpose herein set forth.

66,079.—HOISTING DEVICE.—Sam C. Goodsell, New Haven, Ct.

1st, I claim a hoisting apparatus in which the cylindrical or conical winding drums, whether of the same or of unequal diameters, are combined with the hoisting rope and pulley and gears under the arrangement herein set forth, so that the weight shall be raised or lowered with a differential motion.

2d, The combination of the conical or cylindrical winding drums and their gears, of the hoisting rope attached to said drums under the arrangement herein described, so that when the drums are not caused to rotate by their operative mechanism the weight suspended from the said rope shall cause the locking of the gears as set forth.

3d, The combination in an apparatus such as described of the winding drums or cylinders and their gears, with the mechanism for rotating the same, arranged and operating as herein shown and specified.

4th, The combination in an apparatus as described of the winding cylinders and mechanism for revolving the same, with the truck wheel upon which the said apparatus is mounted, under such an arrangement that by the movement of the cylinders the said wheels may be rotated and the apparatus moved in either direction as set forth.

5th, The combination with the truck wheels, winding cylinders, and mechanism for revolving the same, of the clutches for throwing said wheels in and out of gear with said cylinders and driving mechanism, substantially as shown and specified.

66,080.—VACUUM PAN SUGAR-BOILING APPARATUS.—Charles Harriman, New York City.

I claim the combination with an apparatus substantially of the character specified, of a Torricellian pipe or tube, E, connecting the receiver, C, with a vessel or vessels below, essentially as and for the purpose herein set forth.

66,081.—CHUCKS.—G. W. Harris and Wm. H. Haight, (assignors to William H. Haight), New York City.

We claim the operating ring, e, constructed with the internal screw, g, and the nut, B, formed with radial grooves, e', in combination with the conical shell, A, and sliding jaws, C, substantially as and for the purpose herein described.

66,082.—CRACKER MACHINE.—John E. Hawkins, Lansingburgh, N. Y.

1st, I claim the conducting tubes divided into two parts, T and T', in combination with the knife, K, working between them substantially as described.

2d, The knife, K, consisting of a thin plate of sheet metal provided with holes for the dough to pass through, in combination with a spring to throw the knife and the lever, I, and cam, I', to move back the knife so that the dough can again pass through the holes, substantially as described.

3d, The outside tubes or thimbles working on the lower sections, T', of the conducting tubes, and operated substantially as described.

4th, The docker, consisting of the plates, o p r and s, the prickers, v, stamper, W, and spiral springs, 8 and 9, all combined, constructed and operating substantially as described, to press, prick and stamp a row of crackers at one operation, substantially as described.

5th, I claim the mechanism moved by a crank on the main driving shaft, by means of which an intermittent motion is given to the grooved rollers, the endless apron and the docker, substantially as described.

6th, I also claim in combination with the docker the thin plate, R, constructed, arranged and operating substantially as and for the purpose described.

66,083.—HOT-AIR FURNACE.—F. C. Hesse, Cincinnati, Ohio.

1st, I claim the annular supply chamber, I, provided with the dampers, f f', when secured to the bed plate, A, or its equivalent, having the perforations, e, substantially as and for the purpose specified.

2d, The casing, F, having perforations, s' the incline perforated plate, b, attached thereto, and the diaphragm, K', all in combination with the base plate, A, with perforations, a, the inner wall, B', of the dead air chamber and the top plate, C, substantially as described.

3d, The base plate, A, walls, B B', and top plate, C, in combination with the fire pot, G, perforated fire back, H, diaphragms, K K', warm air tubes, L, casing, F, hot air reservoir, N, smoke pipes, O and Q, smoke stack, P, and damper, P'', constructed and arranged substantially as and for the purpose specified.

4th, The hot air reservoir, N, smoke pipe, O, smoke-stack, P, having an opening, P', near its bottom, and the damper, P'', for closing the same, in combination with the smoke pipe, Q, substantially as described.

66,084.—CURTAIN FIXTURE.—Jacob J. Hessler, Reading, Pa.

I claim the sliding knob, B, working through the slot, b, of the barrel, A, and arranged in relation with the rod, c, and spiral spring, d, contained in the said barrel, substantially as and for the purpose specified.

66,085.—ROTARY STEAM ENGINE.—William H. Holland, Chelsea, Mass.

1st, I claim the chambered drum, E, and journals, F F, when constructed and operating substantially as described and for the purpose set forth.

2d, I claim the groove or depression, x x, on the drum on each side of the piston, as and for the purpose described.

3d, I claim the arrangement of the packing on the upper portion of the abutment, D, as described.

4th, I claim the arrangement of the packing piece, w, placed at the bottom of the abutment groove for the purpose of packing the space between the end of the abutment and the drum, E, and also between the drum and the cylinder over the packing rings as described.

5th, The arrangement of the spring, o, with the abutment, D, drum, E, and groove or depression, x, as and for the purpose set forth.

6th, The exhaust passage, p, one or more placed in the cylinder for the purpose of relieving the abutment of the pressure of the steam just previous to its being raised to allow the piston to pass.

7th, I claim the arrangement of the fly wheel or pulley, provided with cams between the cylinders as shown.

66,086.—HARNESS PAD.—John Hosford, Monroeville, Ohio.

I claim the arrangement of the upper tree, C, and flanges, a, in combination with the lower tree, A, when combined with the usual adjuncts to form a harness pad.

66,087.—BALE-BAND TIGHTENER.—Platt C. Ingersoll (asignor to himself and H. F. Dougherty), Greenpoint, N. Y.

I claim the clamping links or grippers, B C, in combination with each other and with the lever, A, substantially as herein set forth for the purpose specified.

66,088.—SEEDING MACHINE.—P. C. Ingersoll (assignor to himself and H. F. Dougherty), Greenpoint, N. Y.

1st, I claim the combination of the series of adjustable slides, c, with the series of holes or openings, b, formed in the circumference of the rotating hopper, C, substantially as and for the purpose herein set forth.

2d, The adjustable sliding gate, C', arranged in relation with the rotating hopper, C, substantially as and for the purpose specified.

3d, The lever, g, combined in relation with the sliding gate, C', and rotating hopper, C, substantially as and for the purpose specified.

4th, The transverse spurs or projections, j, arranged in relation with the angular circumferential rib, i, of the furrowing wheel, F, substantially as and for the purpose specified.

5th, The drag-bar, D, arranged in rear of the seed dropping mechanism, and furnished with covering shares, constructed as described, substantially as and for the purpose specified.

6th, The lever, H, and lifting cords or chains, n r, arranged in relation with each other and with the furrowing wheel and drag bar, substantially as and for the purpose specified.

66,089.—PREPARING COTTON SEED FOR PLANTING.—P. C. Ingersoll (assignor to himself and H. F. Dougherty), Greenpoint, N. Y.

1st, I claim the process of preparing cotton seed for planting by subjecting the same to a rubbing action between a corrugated and a rubbing surface, substantially as herein set forth.

2d, The corrugated rubber, in combination with the bed having a roughened surface, substantially as and for the purpose specified.

66,090.—BURGLAR-ALARM LOCK.—George Jacobs, Washington, D. C.

1st, I claim the employment of arms, L N O, for the purpose of holding and letting off the alarm arrangement, substantially in the manner set forth.

2d, In combination with the above, I claim the sliding pivot, C, and spring, e, substantially as and for the purpose described.

3d, The circular plate, D, provided with deceptive holes, in combination with arms, L N O, operating substantially as specified.

4th, I claim the arrangement of bolt, A, arms, L N O, spring, M, sliding pivot, C, and plate, D, substantially for the purpose described.

66,091.—SPINDLE BEARING.—B. H. Jenks, Bridesburgh, Pa.

I claim the combination of the bolster cap and rail, arranged as shown and described, and constructed and operating as set forth.

66,092.—ROTARY STEAM ENGINE.—C. Kaiser, New York City.

1st, I claim the segmental piston, B, moving in the cylinder, A, in combination with the transversely sliding valve, C, constructed and operating substantially as and for the purpose described.

2d, Connecting the piston, B, to the piston wheel, F, in such a manner that it is free to rock, substantially as and for the purpose set forth.

3d, The slide valve, C, and segmental piston, B, in combination with the jacket, J, on the cylinder, constructed and operating substantially as and for the purpose set forth.

4th, The cut-off, K, in combination with the slide valve, C, segmental revolving piston, B, and cylinder, A, constructed and operating substantially as and for the purpose described.

66,093.—MACHINE FOR PRESSING PEAT.—F. Leach, Tioga, N. Y.

1st, I claim the combination of the receiving box, A, with the mold box, B, stationary plunger, D, and pressing plunger, C, when said mold box is operated by any suitable means, as described, and the plunger, C, actuated by fluid under pressure, essentially as set forth.

2d, The combination of the rams, K E, cylinders, F L, pressing plunger, C, mold box, B, with its stationary plunger, D, and receiving box, substantially as shown and described.

3d, The combination, with the ram, K, of the cylinder and its pressing plunger, of valves controlling the supply of the operating fluid thereto from different sources or under different pressures, essentially as specified.

4th, The automatic operation of the mold box and pressing plungers under different heads or pressures by separate and distinct valves, geared together for operation by the mold box and pressing plunger, substantially as herein set forth.

5th, The valve, R, constructed for operation and adjustment, essentially as shown and described.

66,094.—CURTAIN FIXTURE.—Chapman Lee and Joseph Paudler, Washington, D. C.

1st, We claim the combination of a gear wheel and pinion with the cord wheel, for operating a window-curtain roller, substantially in the manner set forth.

2d, We claim the combination of the spring, D, locking bolt, C, and slide, E, for tightening the cord in connection with the notched plate, A, and cord wheel, B, substantially as described.

66,095.—FULLING STOCKS.—William B. Lodge, Danbury, Ct.

1st, I claim the combination, with the hammers or beaters, B, of the cam or friction blocks, C, operating to effect the lift of the former, and to suddenly release them when raised, substantially as specified.

2d, The combination, with the hammer or hammers of the mill, of an adjustable spring tension device, arranged to control their fall, essentially as herein set forth.

3d, The combination toes, G, made of india-rubber, or other analagous soft material, with the hammers, B, substantially as specified.

4th, The combination with the beater, B, of the hot-water box or bath, J, and the bosom, H I, operating on the material being fulled, substantially as specified.

66,096.—MACHINE FOR SIZING OR PLANKING HAT BODIES.—Wm. B. Lodge and H. Platner, Danbury, Ct.

1st, We claim the combination with the upper and middle aprons, E F, arranged to travel as described, of the shell, Q, at the exit end of the upper apron, essentially as and for the purpose specified.

2d, The combination, with the aprons, E, and F', of a guideboard, R, and roller, S, at the feed end to said aprons, traveling as described, substantially as herein set forth.

3d, In combination of endless lag aprons, apertaining with their contiguous surfaces in opposite directions, as and for the purposes specified, the arrangement of a steam pipe or coil for the introduction of steam between said aprons, essentially as specified.

4th, The combination with the vertically adjustable aprons, F and F', of counterbalance weights, or their equivalent, to facilitate the adjustment of the same relatively to a center or fixed apron, substantially as described.

66,097.—MACHINE FOR SIZING HAT BODIES.—W. B. Lodge, Danbury, Ct., and H. Platner (assignors to themselves and F. Shaller), Hudson, N. Y. Antedated June 15, 1867.

1st, We claim, in hat-planking machines, the arrangement of three or more endless belts or aprons of lags, made to travel with their contiguous faces or surfaces in opposite directions, all at different velocities, relatively to each contiguous one, substantially as specified.

2d, The combination with an endless belt or apron, E, of lags having a fixed or positive motion of two or more endless lag belts or aprons, F and F', arranged as specified, and so geared to operate in connection with the belt, E, as that they, F and F', can, during the progress of the work, be made at pleasure to travel with their surfaces adjacent to E, in a reverse direction, at a reduced velocity, relatively thereto, or be left free to act independently of it, substantially as described.

3d, The combination of the lag belts, E and F or F', drums, B and B1 or B2, at the one end of the machine, wheel, P, levers, U or U1, and wheels, Q and S or R and T, for operation, essentially as and for the purposes herein specified.

4th, Constructing the sideboards, D1, with their rails, c1, in sections, and holding or uniting them by springs or weights and screw bolts, to give the

lag apron, F or F1, a vertically flexible character, substantially as herein set forth.

5th, The combination with a stationary arranged endless lag belt or apron, E, of one or more lag sprons, F or F1, arranged to travel at a reduced velocity, and relatively to the belt, E, as specified, and made vertically adjustable in relation thereto by means of lifting cams, G G1, or other suitable devices, essentially as specified.

6th, The combination with an endless lag belt or apron, E, having inflexible rails or guides, c, of an endless lag belt, F or F1, with its rails or guides, c1, made in sections and flexible, said aprons, E and F or F1, being arranged and operating relatively to each other, substantially as described.

66,098.—MACHINE FOR SETTING CARD TEETH.—David McFarlane, Worcester, Mass.

I claim, 1st, The combination with the clamp which feeds the wire, of the following mechanism, viz., the lever, D, whether adjustable or not, arranged to operate between the clamp and the operating cam so as to give to the clamp its lateral motion, and a separate and independent clamping lever or device for actuating the clamp to hold and feed the wire, substantially as set forth.

2d, The combination of the feed lever, D, spring clamping lever, E, and wire holding lever, F with the clamp, a, substantially as set forth.

3d, The combination with lever, D, of the fulcrum pin or stud, b, collar, m, and adjusting screw, p, or equivalent means for making the collar adjustable, substantially as and for the purposes set forth.

4th, In a machine such as described I claim the construction and arrangement of the lever for producing the feed substantially as described.

5th, The combination of the doubler plate, K, and crowner bar, R, with the doubler, P, and doubler bar, O, made adjustable as and for the purposes set forth.

6th, The combination with the wing plate, T, crowner bar, R, and cam block, 17, of the compound or three-functioned cam, V, all constructed and operating in relation to one another and to the doubler plate, K, substantially as and for the purposes set forth.

7th, The combination with the clamp, a, of the bow or plate spring, g, and spiral spring, h, arranged for joint operation substantially as and for the purposes set forth.

8th, The combination with the perforating bar of the mechanism for operating the same, arranged as herein described, so that the said bar may be elevated before its forward motion is imparted, for the purposes stated.

9th, The combination with the upright dogs, 42 and 43, and double inclined and grooved cam, 44, of the holding box, 46, substantially as and for the purposes set forth.

10th, The combination of the ratchet wheel, 41, of the retaining dog, 45, feeding dogs, 42 and 43, double inclined and grooved cam, 44, and holding box, 46, arranged for joint operation substantially as and for the purposes set forth.

11th, The combination with the stop lever, D'', of the stop guard, F', substantially as and for the purposes set forth.

66,099.—BOOT LACING DEVICE.—A. McKenney, Portland, Me., and S. Carpenter, Patten, Me.

We claim a shoe lacing device constructed to operate substantially as set forth.

66,100.—SPIKE.—John McMurtry, Lexington, Ky.

I claim the within described spike, consisting simply of a single shank provided with a beveled or sloping end and shoulder, said shoulder and beveled end being upon the same side, as and for the purpose set forth and described.

66,101.—MANUFACTURE OF SAFETY MATCHES.—Lotto P. Meyer, Bethlehem, Pa.

I claim, 1st, The application of certain ingredients substantially such as herein specified, for the preparation of a compound for safety matches and for the purpose specified therein.

2d, The application of certain ingrepients substantially such as herein specified, for the preparation of special surfaces for the ignition of safety matches and for the purpose specified within.

66,102.—MAKING PHOTOGRAPHIC TRANSFERS.—Arthur G. Mowan, South Bergen, N. J.

I claim, 1st, The combined process hereinbefore described for making photographic transfers by means of the several methods, preparations, applications, and compositions above described, or their equivalents.

2d, I also claim the preparation of the paper by a bath of whey or lactine as above described, when used in combination with the other elements of the process above described or their equivalents.

3d, The preparation and application of the coating of gelatine or its equivalent and permanganate of potassa, for the purposes above described, whether the same is used in combination with the other elements of my entire process or is used separately therefrom as a material to be acted on by the light and subsequently to be dissolved and removed where it has not been so acted upon.

4th, The use of a paper so prepared and coated as above described in the formation of the impression thereon by the action of the light according to the usual modes.

5th, The preparation and the application of the second coating above described, composed of Judea bitumen, white wax, and Burgundy pitch, or their equivalents, without grease or oil, for the purposes above described, whether the same is used in combination with the other elements of my entire grocess or is used separately therefrom, as a material to give color to the picture on the paper and to act as a medium for transferring it.

6th, The removal of both the coatings above described from the parts or spaces not acted on by the light, by placing the paper so prepared and coated with the materials above described, or their equivalents, in a bath of cold water in the manner above described, and cleaning it in the manner above described, or by any equivalent method of solution and removal.

7th, The impressing of a photographic picture or design or printed or written matter upon stone, wood, or metal, from a paper proof made and prepared as above described, for the purpose of engraving, lithographing, etching, or preparing plates for printing such picture, design, or printed or written matter.

66,103.—SPRING HINGE.—A. M. Olds, New York City. Antedated June 15, 1867.

I claim the hinge constructed substantially as described.

66,104.—RING TRAVELERS FOR SPINNING.—Henry T. Potter, Norwichtown, Conn.

I claim, 1st, The transverse bar, e, in combination with the ring and spindle, substantially as and for the purpose specified.

2d, The annular plate, b, arranged in relation with the transverse bar, e, the ring and the spindle, substantially as and for the purpose specified.

66,105.—BOAT-DETACHING TACKLE.—Carl H. Ramsten, Carlskrona, Sweden.

I claim a tackle block, D, provided with a locking lever, E, to a hinged or pivoted detaching hook, S, and fair-leaders, I, all arranged substantially as described and for operation in connection with or by a rope or chain, H, substantially as specified.

66,106.—STIRRUP.—Nathan L. Revere, Worcester, Mass.

I claim the combination with the stirrup, E, and strap, A, of the case B (having ears, c c, and a pin, b), spiral spring, e, piston rod, C, and head, D, said parts being constructed and arranged to operate in relation to each other substantially as and for the purposes set forth.

66,107.—BOLT CUTTER.—J. Strayer and T. Hazelhurst, South Bend, Ind.

We claim, 1st, The bolts, E, in combination with the cutters, C, and springs, G, arranged and operated substantially as above described.

2d, The combination of the springs, G, cutters, C, chuck, B, and bolts, E, substantially in the manner and for the purposes set forth.

66,108.—GATE.—Richard Tattershall and John A. Burchard, Beloit, Wis.

We claim, 1st, broadly, the oscillating circular plane, E, for the purpose set forth.

2d, A gate constructed substantially as described, in combination with the double sliding hinge, C C B, the oscillating circular plane, E, lever, I, the crank levers, L L, rods, K K, bell-crank levers, S S, the pulley, H, standard, A, and self-fastening latch, W, arranged and operating as and for the purpose specified.

66,109.—PLOW.—James Wallace, Sheridan, Pa.

I claim the jointed rod, D D', used in combination with the beam and the handle, H, as and for the purpose specified.

66,110.—MAGAZINE FIRE-ARM.—H. F. Wheeler, Boston, Mass.

I claim, 1st, A magazine pistol in which the cartridges are arranged in a vertical or approximately vertical chamber forming the handle, substantially as shown and described.

2d, I also claim effecting the movement of the cartridges to bring each into position to be fired by the vertical ratchet bar, x, carrying the cartridges transversely to itself, substantially as set forth.

3d, The flange groove or grooves and friction surface or surfaces for guiding and supporting the cartridges, substantially as described.

4th, The construction and arrangement of the expanding and contracting trigger lever, by which as the resistance to the forward movement of the barrel increases, the length of the acting arm of the lever decreases, substantially as shown and described.

66,111.—DRIVING BELT.—T. R. White and W. G. Bedford, Philadelphia, Pa. Antedated June 15, 1867.

We claim a driving belt composed of wires corrugated or bent as described and threads of cotton or other fibrous material interwoven as set forth.

66,112.—GUIDE FOR CARDING MACHINES.—F. W. and E. T. Albertine, Hanover, Conn.

We claim, 1st, The guide plate, A, perforated and slotted substantially in the manner herein shown and described and for the purposes set forth.

2d, The combination of the roller, E, with the guide plate, A, substantially as herein shown and described and for the purpose set forth.

66,113.—GATE.—David D. Baker, West Alexandria, Ohio.

We claim the combination and arrangement of the levers, c d, posts, e f, clasp hinges, x x, and slot bar, l, when constructed, arranged, and operating conjointly in the manner described for the purpose specified.

66,114.—THILL COUPLING.—Frederick Ballard, Waverly, Md.

I claim, 1st, The combination of the spring, G, box, F, and pressure bolt, E, constructed and operating in the manner and for the purpose specified.

2d, The soft metal bushing, K, provided with a square opening, z, and used in combination with the bolt, D, and tubular eye, F', of the thill iron, substantially as described.

66,115.—PICTURE HOLDER.—Albro Barber, Port Byron, Ill.

I claim a holder for photographic or other pictures in which a series of frames for the pictures is so arranged that by moving or drawing one end of the box out or in, such frames in regular order and succession will be brought in position for being viewed, substantially as described.

66,116.—CASTER.—James T. Barnes, Hudson City, N. J.

1st, I claim the axle, A, supporting two wheels, B, and having secured at its center and at right angles thereto the arm, C, supporting the shank, D, constructed as described for the purpose specified.

2d, I further claim the securing of the socket or sheath, E, to the leg or bottom of the article to which the caster is applied, by means of the spurs, d d, projecting laterally from the cylindrical part, a, and fitted in the hole, e, which receives said part, a, substantially as shown and described.

66,117.—ROOFING.—E. Becker, Cincinnati, Ohio.

I claim the curved edge and doubled over edge of the two overlapping edges of the metallic plates, A, substantially as and for the purposes described.

66,118.—BLACKSMITH STRIKERS.—George Bell (assignor to himself and Jonathan Strine), Martinsburg, West Va.

I claim the combination of the spring, R, adjusting device, W, frame, V, hammer and lugs, C J, chain, K, and treadle, L, all constructed and arranged as described.

66,119.—EXTRACTING GREASE AND OILS FROM ANIMAL AND VEGETABLE SUBSTANCES.—Joseph Besso, Philadelphia, Pa.

1st, I claim the improved apparatus consisting of the reservoir, A, the force pump, B, the retorts, C C', the alembic, D, the condensing vessels, E E', the receiving vessels, F F1 F2, the gasometer, G, and the steam pipe, h, combined, arranged, and operating substantially as and for the purpose herein described.

2d, The force pump, B, in combination with the reservoir, A, and the retorts, C C', arranged and operating as and for the purpose herein set forth.

3d, The gasometer, G, in combination with the pipe, g, and the retorts, C C', arranged as and for the purposes specified.

66,120.—TINNER'S RULE.—Thomas Bigelow, Elkhart, Ind.

I claim the arrangement and construction of a rule comprising a system of scales, in the manner as herein set forth for the purpose specified.

66,121.—MACHINE FOR MAKING STARCH, PASTE, SIZE, ETC.—C. H. Blanchard, Boston, Mass.

I claim, 1st, The combination of the perforated diaphragms, O O, of the mixing tanks with the revolving brushes, K K K, substantially as described and for the purpose set forth.

2d, The device, or its mechanical equivalents, for giving the shafts, I I, of the stirrers their reciprocating motion, substantially as described and for the purpose set forth.

3d, The combination and arrangement of the hollow steam-heated cooking rolls, S S, substantially as described and for the purpose set forth.

4th, The combination and arrangement of the cooking tank, R, the rolls, S S, and the scrapers, T T, substantially as described and for the purpose set forth.

5th, The general construction, combination and arrangement of the several parts of the machine, substantially as described and for the purpose set forth.

66,122.—CHURN.—Frank Blecka, Elgin, Ill.

I claim agitators, C C " pinions, L L,' 'and wheel, T, when used in combination with a rotating case, substantially as and for the purpose set forth.

66,123.—COMBINED SEEDER AND FERTILIZER.—Henry Bourn, Mendon, Mich.

I claim, 1st, In combination with the driving bevel gear wheel, M, the the shaft, J, provided with the bevel pinion, L, and crank wheels, I and S, for the purpose of operating the agitating mechanism in both hoppers from the same shaft, substantially as set forth.

2d, The slide, F, provided with the brushes, K K, and moving the same across the escape orifice in the bottom of the hopper, and for the purpose set forth.

3d, The triangular slide, P, placed in the open bottom of the hopper and nearly filling the area of the same and provided with the spikes, Q, as and for the purposes set forth.

4th, Hanging one side of the hopper upon hinges or other joints so that the area of the hopper bottom may be increased or dsminished, in the manner and for the purposes set forth.

5th, The seat, T, adjustable forward and backward, as set forth, in combination with the main frame, A, and hoppers, D O, so that the weight of the driver may be caused to balance the machine, as set forth.

66,124.—MACHINE FOR UNHAIRING HIDES.—Elias Brock, Ellenville, N. Y.

1st, I claim the combination of the pair of feed rollers, D E, with the knife cylinder, B, of an unhairing machine, substantially as herein shown and described and for the purpose set forth.

2d, Arranging the guide roller, F, knife cylinder, B, and feed rollers, D E, with each other and with the frame, A, of the machine, substantially in the manner herein shown and described, so that the hides or leather shall be drawn over the knife cylinder, B, in a direction opposite to that in which the surface of the said knife cylinder is moving.

3d, The combination of the roller, I, with the frame, G' to which the apron, H, is attached, substantially as herein shown and described and for the purpose set forth.

4th, Arranging the gearing, K L M N O P R, substantially in the manner herein shown and described, for the purpose of communicating motion from the knife cylinder, B, to the feed rollers, D E.

66,125.—MACHINE FOR SOFTENING OR DRESSING LEATHER OR SKINS.—F. J. Burcham, Racine, Wis.

1st, I claim the combination of the quadruple crank, C, pitman, D, levers, E, and connecting rods, G, with each other and with the stretching frame to which the skin is attached, substantially as herein shown and described and for the purpose set forth.

2d, The stretching frame, H, constructed and operated substantially as herein shown and described and for the purpose set forth.

3d, The stretching frame, N, constructed and operated substantially as herein shown and described and for the purpose set forth.

4th, The clamp, I, constructed and arranged substantially as herein shown and described and for the purpose set forth.

5th, The clamp, K, constructed and arranged substantially as herein shown and described, when used for the purpose of attaching skins to a stretching frame.

6th, The clamp, L, constructed substantially as herein shown and described, when used for the purpose of attaching skins to a stretching frame.

7th, The double spring-hook, M, constructed substantially as herein shown and described and for the purpose set forth.

66,126.—KNIFE CLEANER.—W. J. Burge, Atchison, Kansas.

I claim in a knife cleaner the combination of the handle, A, having a cavity, D, closed by a stopper, C, and the rubbing surface or layer, B, arranged, constructed and operating in the manner as shown and described and for the purpose set forth.

66,127.—FUNNEL.—Frederick Catlin, Watertown, Conn.

I claim the construction and arrangement of the funnel, A, having detachable throat, B, strainers, E F, valve, C, and stand, D, substantially as described for the purpose specified.

66,128.—COTTON CULTIVATOR.—G. W. Chambers and Isham Washam, Talladega, Ala.

We claim the arrangement of the lever, d, and the sliding cross piece, G, to engage and disengage the bevel gear, b b, in the manner and for the purpose herein specified.

66,129.—PORTABLE FENCE.—Peter Chandler, Olney, Ill.

1st, I claim the pin, b, in combination with the braces, B, and battens, C, substantially as and for the purpose described.

2d, In combination with the elements of the above, I claim the arrangement of the battens, D E, the former being provided with the notches, d d,' and retaining pin, d2, and the latter with slotted projections, e e', as and for the purpose set forth.

66,130.—MANUFACTURE OF BLANKS FOR CARRIAGE THILL SHACKLES.—J. B. Clark, Plantsville, Conn.

1st, I claim the carriage shaft shackle blank so formed between dies that the body, b, of the blank is curved, substantially as herein shown and described.

2d, The dies, A and B, for making the said blank when so constructed and arranged as to form the rounded corners and the curved body of the said blank, substantially as herein shown and described.

66,131.—FRAME FOR STRETCHING WET LEATHER.—I. W. Dawson, Newark, N. J.

I claim the combination and arrangement of the longitudinal bars, A and B, cross bars, C and D, inclined pivoted bar, E, and inclined stationary bar, b2, with each other, substantially as herein shown and described and for the purpose set forth.

66,132.—METHOD OF TRANSFERRING CARS FROM ONE TRACK TO ANOTHER.—John Denhard, Reading, Pa.

I claim the rails, A A', of the main track and the rails, B B,' of a turn out or siding in combination with the stationary inclined bar, e, and the movable bars, D D,' the whole being constructed substantially in the manner and for the purpose described.

66,133.—DRAIN PLOW.—R. W. Downman, Georgetown, D. C.

I claim the attachment of the double cone roller, B, as herein described to the ordinary drain plow, in the manner and for the purposes above stated.

66,134.—KALEIDOSCOPE.—John Earnshaw, E. Greenwich, R. I.

1st, I claim so constructing a kaleidoscope that both its ends may be used, as described.

2d, The object glass provided with lines, G, substantially as described and for the purpose set forth.

3d, Covering the object glass, Fig. 1, with figured paper or fabric, as and for the purpose described.

4th, The object glass, Fig. 2, provided with hole, D, in its covering to adapt it for use as the eye glass, substantially as described.

5th, The windows, E, arranged substantially as and for the purpose set forth.

6th, The detached framework carrying the object glass, Fig. 1, as and for the purpose described.

7th, As an article of manufacture the design paper adapted for use in conjunction with a kaleidoscope, as herein described and for the purpose set forth.

8th, In combination with a kaleidoscope the pictures or designs and slotted receptacles therefor, substantially as described and for the purpose set forth.

65,135.—HARVESTER.—Jonathan Emery, Cedar Falls, Iowa.

I claim the flexible swinging curtain, H, arranged in the relation to the binders station and to the endless conveyer, G, and endless compressing apron F, substantially as and for the purpose set forth.

2d, The rotating platform, K, for supporting one or more binders in combination with a receptacle, E, into which the cut grain is delivered, substantially as described.

3d, The combination of the rotating binders station and the endless conveyor, G, and endless compressing apron, F, substantially in the manner and for the purpose described.

4th, The arrangement of the gears, chains and cranks for operating the aprons, F G, and the sickle, Q, directly from the main supporting axle and wheel, B B1 B2, substantially as shown and described.

5th, The arrangement of the pivots of the arms, P P, on each side of the driving wheel, B' and below the axle in combination with the latch lever, p, rock shaft, r, arms, r' v, and link, n, arranged and operating as described and shown.

6th, A rotating binders station, in combination with a harvester.

66,136.—SAFETY RAILROAD SWITCH.—B. F. Farrar (assignor to himself and D. B. Wesson), Springfield, Mass.

I claim a railroad switch constructed and arranged that if left in a wrong position, the wheels of a passing train will return the rails temporarily to their proper position and the train continue upon the main track, substantially as herein set forth.

66,137.—MANUFACTURE OF WHITE LEAD.—T. M. and A. G. Felt, Brooklyn, N. Y., assignor to William Bell, New York City.

We claim the treatment of chloride of lead in the manner and for the purpose, substantially as herein described.

66,138.—MANUFACTURE OF WHITE LEAD.—Thomas M. and Ambrose G. Fell, Brooklyn, N. Y., assignor to William Bell, N. Y. City.

We claim the treatment of salts of lead other than carbonates, and the carbonate, of baryta, in the manner and for the purpose, substantially as described.

66,139.—MANUFACTURE OF WHITE LEAD.—T. M. Fell, and A. G. Fell, Brooklyn, N. Y., assignor to to themselves and William Bell, New York City. Antedated April 11, 1867.

We claim the treatment of chloride of lead in the manner and for the purpose substantially as herein described.

66,140.—MODE OF TREATING LEAD SALTS FOR THE MANUFACTURE OF WHITE LEAD.—T. M. Fell, and A. G. Fell, Brooklyn, N. Y., assignor to themselves and William Bell, New York City. Antedated April 11, 1867.

We claim the treatment of oxide of lead with the chloride of sodium or its equivalent, substantially as described for the purpose of producing a superior chloride or any oxy-chloride of lead.

66,141.—MACHINE FOR CUTTING CORKS.—L. W. Felt, Keene, N. H.

1st, I claim the cutter bars, F F, having the stops, F, F', in combination with the fixed collar, l, the reciprocating collar, s', the slots, t t, ring, s, and clamp, q, attached to the rod, P, and the beveled projections, x x, all constructed and operating substantially as herein described and for the purpose set forth.

2d, The reciprocating rod, g, in combination with the levers, e and d, for discharging the cork when cut from the cutters, substantially as herein described and set forth.

66,142.—AMALGAMATOR.—J. B. Forissier, New York City.

1st, I claim the arrangement of the circular revolving and annular stationary pans, the same being constructed as described, so that the water containing the ore may fall from top to bottom of the apparatus in a zig-zag line, and be thus distributed over the whole surface of the mercury, as set forth.

2d, The stirrers, L, when secured to the underside of the pans, G and H, and when they are constructed and operate substantially as and for the purpose herein shown and described.

3d, An amalgamator made and operating substantially as herein shown and described.

66,143.—BAND CUTTER FOR THRESHING MACHINE.—W. P. French, Washington, Iowa.

I claim the double adjustability caused by the means substantially herein set forth.

66,144.—SHOVEL PLOW.—Daniel Gilbert, Carbondale, Ill.

First, I claim forming the shovel or plow plate, F, with a groove or notch in the under side of its upper part to fit upon the bar, E, substantially as herein shown and described and for the purpose set forth.

Second, The combination and arrangement of the bar, E, with the upright C, and horizontal or ground bar, D, substantially as herein shown and described and for the purpose set forth.

66,145.—POTATO DIGGER.—J. E. Giles and Charles S. Mc Robert, Meads Mills, Mich.

1st, We claim the digger, H, and screen, J, constructed substantially as herein shown and described in combination with each other and with the frame, A, as and for the purpose set forth.

2d, The combination of the axle, C, lever, E, and chain, F, with each other and with the frame, A, substantially as herein shown and described for the purpose set forth.

3d, Operating the screen, J, from the drive wheel or wheels, D, by means of the bevel gear wheel, N, wheel, O, shaft, P, wheel, S, and arm, U, substantially as herein shown and described.

66,146.—WOOD TURNING LATHES.—Andrew Goodyear, Springport, Mich.

1st, I claim the combination in one machine for turning wagon hubs, of the sets of cutters one set of which may be brought into action for roughing out the hub and a second set then brought into action for the purpose of finishing the hub, the mechanism thereof, being constructed and arranged to operate substantially as set forth.

2d, The combination of the yoke from D, hinged to the main frame, A, roughening cylinder, C, arm, a, rod, r2, spring, s, said parts being respectively constructed and arranged substantially as described.

3d, So arranging the operating mechanism of the two sets of cutters that the roughening cutters shall revolve at a high speed at the same time that the hub subjected to its action revolve slowly, and the adjustable finishing cutter fixed upon sides shall act upon the hub when made to revolve at an increased speed, substantially in the manner set forth.

66,147.—BILLIARD CUE.—C. H. Gould, New York City.

I claim in combination with a billiard cue, I, the use or employment of a tip formed of hard and soft rubber, substantially as and for the purposes herein fully described.

66,148.—TABLE.—H. C. Hardy, Muncie, Ind.

I claim the weights, D D, and the levers, e e, in combination with the supporters, C C, arranged and operating substantially as and for the purposes herein described.

66,149.—APPARATUS FOR DRAWING AND WEIGHING LIQUIDS.—E. S Harris and S. S. Robinson, Morrison, Ill.

We claim the faucet, A, and gate, B, when so arranged in combination with one another and with a trigger and other connecting mechanism that the gate shall be closed automatically when the trigger is tripped, substantially as and for the purpose set forth.

2d, The faucet, A, gate, B, bow, C, and spring, D, in combination with the trigger, E, lever, F, stop, G, and spring, H, arranged to operate substantially as set forth.

66,150.—BAG HINGE.—George Havell, Newark, N. J.

1st, I claim the metallic ornamental plate, B, having either an opening or stem in its end for connecting it to the bar, C, which bar is provided with a cylindrical head, d, or band, as described, so that when thus conected to the frame, A, A' they form a neat and substantial hinge, as specified.

2d, The bar, C, and plate, B, constructed substantially as herein described and used for the purposes specified.

66,151.—CANAL LOCK.—George Heath, Little Falls, N. Y.

I claim the mode substantially as herein described of filling canal locks.

66,152.—HEAD BLOCKS FOR SAW MILLS.—Joseph Hubbell, Zanesville, Ohio.

I claim the slotted plates, d, d, made fast on the setting bar, a, in combination with the friction rollers, l, l, on the end of the pushing bars, g, g, the pawl, m, with the rack, h, constructed, arranged and operating as and for the purposes herein described.

66,153.—APPARATUS FOR CARBURETING AIR.—J. H. Irwin, Chicago, Ill.

1st, I claim the combination of a carburreting device with a chandelier bracket or a portable lamp, when arranged and operating substantially as described.

2d, I claim in combination with a chandelier bracket or portable lamp, two carburreting vessel to contain two different grades of hydro-carbon oil substantially as and for the purposes specified.

66,154.—HARVESTERS.—Caleb Lee, (assignor to self and Joshua Lee, Sandy, Ohio.

I claim the combination and arrangement of the frame, A, drag bar, I having the bearings, J, J, for the crank shaft, H, and provided with double joints, K, jointed brace, L, shoe, M, and crank lever, N, all constructed and operated in the manner and for the purpose set forth.

66,155.—GANG PLOW.—John T. Legg, Lewis County, Mo.

I claim the plows, A, A', beams, e, e', rods, F, F', and g, g', the compound lever, H H', lever handles, K, K', and ratchets, M M', arranged, combined and operating for the purpose and in the manner substantially as described.

2d, I claim the lever, n, n', and ratchet, m, m', arranged, combined and operating for the purpose and in the manner described.

3d, I claim the stay chains, P, P', the beams, E, E', the tongue, Q, the strap, R, and the stiffening pole, S, arranged, combined and operating in the manner and for the purpose as heretofore described.

66,156.—VALVES OF STEAM ENGINES.—K. H. Loomis, Cincinnati, Ohio, assignor to Cornelius Van Brunt, Fishkill, N. Y.

I claim, first, the case or seat, B, constructed as described and arranged within a conical opening in its frame and provided with a tapering plug valve, C, said valve being provided with a transverse hub at its centre and with longitudinal slats on each side of said hub, the steam openings being uniform at their intersection, but made flaring from this point outwards and inwards, as specified, the whole being arranged as and for the purposes set forth.

2d, The arrangement of the conical spiral cams, L and I, upon the vertical governor shaft, in combination with the tapering plug valves, J', J', for regulating the flow of steam, to and from the cylinders in the manner herein specified.

3d, The valve seat, B, with central supports, b, b, bearing upon the cones, f, f, when arranged in combination with the valve, C, in the manner and for the purposes specified.

66,157.—STEAM ENGINE OIL CUPS.—F. Lunkenheimer, Cincinnati, Ohio.

1st, I claim the hand wheel nut and cap formed of the parts marked A, A', and A'', arranged and combined substantially as described.

2d, The screw bolt, B, attached to the bottom of the chamber, C, by which the cup and parts attached to the cup are confined, substantially as shown and described.

66,158.—CONFECTION.—E. C. Maltby and Edward Smith, Northford, Conn.

We claim a new and useful confection, composed of the meat of cocoanut prepared in the manner substantially as herein set forth.

66,159.—DITCHING MACHINE.—Chelton Matheny, Greensburg, Indiana.

1st, I claim in a ditching machine the revolving excavating wheel, D, armed with two circumferential cutters, J, J', and a series of radial knives, F, the latter being automatically advanced and retracted by the cams, H and I, as and for the purpose herein described and set forth.

2d, The inclined scraper, L, l, when used in combination with the wheel, D, knives, F, cams, H, I, and cutters, J, J', for the wheel of the excavated earth in the manner explained.

3d, I also claim the pair of revolving cutters or coulters, M, operating as described and for the purpose set forth, when used in combination with the aforesaid wheel, D, J, J', knives, F, and cams, H, and I.

4th, In combination with the wheel, D, J, J', knives, F, and cams, H, I, I claim the shovel or scoop, N, for the object herein explained and set forth.

66,160.—SASH FASTENER.—W. W. Maughlin, Baltimore, Md.

I claim, first, the latch or lever, A, provided with the offset, c, arranged to work underneath the sash bead, and in such manner as to avoid the cutting away or defacing of the jamb or casing outside of said bead, substantially as described.

2d, The latch or lever, A, provided with the offset, c, and lugs or clamps, a, a', arranged and operating as described.

66,161.—DAMPER FOR STEAM BOILER.—Henry McDonough, New York, N. Y.

I claim the valves, D and E, arranged and operating substantially as herein shown and described, in combination with a tubular steam boiler for the purposes specified.

I claim the valves, E, opened and closed by means of the weight, d, and chains, a, a', operated from the valve, D, by the rod, G, as herein set forth for the purpose specified.

I claim the partition plate, C', in combination with the valves for the purpose set forth.

66,162.—WASHING MACHINE.—M. McEnerny, Birmingham, Conn.

I claim, first, the combination and arrangement of the vertically arranged plates or disks, E, E', fitting one within the other, one plate having a lateral adjustment, the other plate having a rotary motion, all substantially as herein shown and described.

2d, I also claim the hopper, h, in combination with the disk or plate, E', for inserting the clothes in the machine substantially as described.

3d, The soap device constructed as described, consisting of the projecting pocket, f, in the disc, E, cap, f', and set screw, g, in combination with the disc, E', as herein set forth forth for the purpose specified.

4th, The treadle device constructed as described and arranged to operate with the disks, E, E', and lever, F, as herein set forth for the purpose specified.

5th, I also claim the combination of the lever, F, with the disk or plate, E' substantially as and for the purpose described.

6th, The combination of the removable tub, K, with the disks, E, E', and the tub, A, substantially as and for the purpose herein shown and described.

66,163.—WHEELWRIGHTS' MACHINE.—Samuel Mills and J. R. McIrvin (assignor to James J. Robinson), Clinton, Ill.

I claim the stock, A, with the notch, c, adjustable arm, D, and graduated end, b, slide, B, provided with pin, a, and pointer, K, screw, G, and slotted plate, F, arranged to operate substantially as herein set forth for the purpose specified.

66,164.—SHEEP RACK.—John D. Munson, Tyre, N. Y.

I claim, 1st, The combination of the pivoted slat frames or racks, C and D, with the frames, A and B, substantially as herein shown and described and for the purposes set forth.

2d, The combination of the division boards or frames, E and F, with the frames, A and B, of the rack, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the hinged boards, G I and H J, with the frames, A and B, and with the division boards or frames, E and F, substantially as herein shown and described and for the purpose set forth.

66,165.—WEIGHING APPARATUS.—J. W. Neal and W. H. Startzman, Big Lick, Va., assignors to themselves and Howard Munnikhuysen, Baltimore, Md., and said Startzman assignor to Neal & Munnikhuysen.

We claim the cam lever, A, cord, E, and weight, f, connected to the shaft, D, when used in combination with the beam, B, and belt, C, all the parts being arranged as specified.

66,166.—NEEDLE CASE.—John F. Newhall, Waltham, Mass.

I claim the needle case constructed as described, consisting of the slotted cylindrical case, B, in which the spindle, D, is pivoted, whose outer end is provided with the conical knob, E, the needle flannel, F, and strip, G, as herein set forth.

65,167.—WASHING MACHINE.—James M. Noble, Delhi, Iowa.

I claim, 1st, the construction of the beater box, B, containing the false bottom, D, over which the gravitating beater, F, slides, substantially as described for the purpose specified.

2nd, The combination and arrangement of the beater box, B, false bottom, D, beater, F, and double water receptacle, E, as herein set forth for the purpose specified.

66,168.—TOILET GLASS.—Albert Ober (assignor to himself John T. Ober, and Samuel F. Ober), Beverly, Mass.

I claim the two mirrors, H I, in combination with the series of folding frames, C D E F, and when necessary the supporting frame, G, hinged to the series of folding frames and attached to a box, A, or any suitable base, all arranged substantially as and for the purpose set forth.

66,169.—ATTACHMENT FOR SPADING FORKS AND SHOVELS.—H. W. Parsons and L. L. Wooster, Whitney's Point, N. Y.

We claim the loop, D, and the pin and collar, C, with the spade or fork, as and for the purpose specified.

66,170.—TRACK-RAISER FOR RAILWAYS.—Hudleson Patterson, Augusta, Mich.

I claim the arrangement of the pointed sliding shoe, F, upon the end of the screw, D, between the uprights, A A, having a curved base, C, and used for elevating railroad tracks in the manner as specified.

66,171.—GATE.—J. B. Powell and S. H. Everett, Macedon, N. Y.

I claim the combination of the pivoting rod, C, having a crank formed upon its upper part, and a pinion wheel, c', attached to its upper end, the toothed and pivoted plate, D, connecting rods, G, and operating levers, H, with each other, with the gate, A, and posts, B and F, substantially as herein shown and described and for the purpose set forth.

66,172.—MACHINE FOR MAKING BUTT HINGES.—Adrian Rais (assignor to Scovill Manufacturing Company), Waterbury, Conn.

I claim the combination of the single bending die, the clamping gage, the cams, the rock shafts and their arms, the pitman, the feeding apparatus, and the pushing slides, or the equivalents of them or either of them, the said combination being organized substantially as described.

66,173.—HANDLE ATTACHMENT FOR BLACKING BOXES.—Thomas S. Robinson, New York City.

I claim the handle, B, pivoted at C, to the bottom, a, or top, b, when constructed, arranged, and operating as herein set forth.

66,174.—HAND SAW.—Edward H. Roe, Jersey City, N. J.

I claim the application of a screw or its equivalent, to a back saw, substantially in the manner as and for the purpose set forth.

66,175.—SAD-IRON HANDLE.—Francis Joseph Schellmann, Syracuse, N. Y., assignor to himself and Theodore Thurber), Auburn, N. Y.

1st, I claim the shank, A, as constructed in combination with the spring catch, a, to hold the handle D, on, and allow it to be easily removed for heating, substantially as and for the purpose herein set forth.

2d, I claim the turned handle, D, spring catch, a, shield, E, and shank, C, as herein described, in combination with a flat or sad iron, substantially as set forth.

66,176.—MACHINE FOR UNHAIRING HIDES.—Judson Shultz, Ellenville, N. Y.

1st, I claim the combination of the apron or belt, E, wound upon or passing around the rollers, G and H, with the knife cylinder, B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the ratchet, I, pawl, J, pawl lever, K, and rack, L, with the journals of the apron or belt rollers, G and H, for the purpose of holding or tightening the belt or apron, F, and shifting its position, substantially as herein shown and described.

3d, Arranging the apron or belt, F, the knife cylinder, B, and feed rollers, D and E, with each other, substantially in the manner herein shown and described, so that the hides or leather may be fed to the knife cylinder, B, in which the said knife cylinder is moving.

4th, Arranging the gearing, N O P R, in the manner herein shown and described, so that the feed rollers, D and E, may be driven at a less velocity than the knife cylinder, B, as and for the purpose herein set forth.

66,177.—WRENCH.—John V. H. Secor (assignor to himself and James D. Secor), New York City.

I claim the sliding jaw, D, provided with the inclined or oblique opening, a, and having the spring, E, attached, and the screws, F, passing through the sides of the jaw into the grooves, f, in the sides of the shank, A, in combination with the racks, c c, in the rear and front sides of the shank, substantially as and for the purpose set forth.

66,178.—CHURN.—Henry Sidle, Minneapolis, Minn.

I claim the arrangement of the box A, provided with ribs on its inner side, dasher B, with its arms CC, as constructed, supports D D, with wheel F, and vertical handle H, for operating cog G, on end of dasher shaft, in the manner and for the purposes specified.

66,179.—STEP LADDER.—Henry T. Smith, Brooklyn, N. Y.

I claim the combination of the extension parts, G and J, and guide straps, H I K L, with the ordinary parts, A and B, of a step ladder, substantially in the manner herein shown and described and for the purpose set forth.

66,180.—SHEEP-FEEDING RACK.—Joel J. Smith, Barnesville, Ohio.

1st, I claim the pivoted bottom B B, in combination with a sheep rack, in manner substantially as and for the purposes described.

2d, The combination of the rack and adjustable troughs, in manner substantially as herein shown and described.

3d, The troughs C, adjustable by the bell cranks and lever arrangements in manner and operating substantially as above set forth and described.

4th, The pivoted shields H, in combination with troughs C, in manner and operating substantially as and for the purposes described.

66,181.—WASHING MACHINE.—L. Smith, Strongsville, Ohio.

1st, I claim the series of beaters B, as arranged in relation to the spring board G, rib H, and springs J, in combination with the inclined bottom, and operating conjointly, substantially as and for the purpose set forth.

2d, The elastic cushion Q, and block P, arranged in relation to the links D, and spring M, and crank, and applied as and for the purpose set forth.

66,182.—WIRE FENCE.—Lucien B. Smith, Kent, Ohio.

I claim the construction of a wire fence provided with rotary spools c c, having radial spurs, d d, and supported by cast-iron posts A, arranged as and for the purpose herein described.

66,183.—FRUIT AND POULTRY BOX.—Daniel B. Spinning, Brooklyn, N. Y.

1st, I claim the manner of connecting the cover to the back C', of the box by means of staples e e, and slotted plates g g, substantially as herein shown and described.

2d, A folding box, when made of the pieces A B B C C' D and E, all being hinged, connected, and fastened substantially in the manner herein shown and described.

66,184.—MACHINE FOR TRIMMING HEELS OF BOOTS AND SHOES.—Caleb S. Stearns (assignor to himself and W. E. C. Worcester), Marlboro, Mass.

I claim the revolving table F, with its swinging frames T, operated by mechanism substantially as described for traversing the heels to and from the knife, and for holding them in position while being trimmed, substantially as set forth.

I also claim the shafts E, with their gears D, revolved by the toothed portions b b', of the annular ring C, in combination with the pins a a', and their plates U V, or other suitable mechanism for producing the required revolution of the heels, substantially in the manner set forth.

I also claim the incline 10, for raising the plates U, which support the heels for the purpose of holding them firmly in position between said plates U, and yielding pressure plates V, substantially as set forth.

66,185.—MARKING ATTACHMENT FOR SEWING MACHINES.—R. H. St. John, Belfontaine, Ohio, assignor to J. W. Russell and D. S. Covert, New York City.

I claim the spindle E, having dog or foot piece K, marker H, spring M, screw J, holder B, and presser foot A, when constructed and arranged as herein set forth for the purpose specified.

66,186.—HORSE RAKE.—Jas. F. Swinnerton, Marion, Ohio.

I claim the combination of the plate or socket L, hook M, and ring N, with each other, and with the tongue K, and frame F G, substantially as herein shown and described and for the purpose set forth.

66,187.—EXTENSION SCAFFOLD.—C. M. Tanner, Mentor, Ohio.

1st, I claim the windlass A, guy ropes A' and A2, in combination with the platform H, operating substantially as and for the purpose specified.

2d, The swing braces, D1, hinged to and in combination with the main frame, as described, and operating as and for the purpose set forth.

66,188.—SEED AND GRAIN SIEVE.—H. S. Townsend, Greenvale, Ill.

I claim, 1st, Extending the screen, D, of a grain or seed separator or threshing machine, beyond the ordinary grain shoe, and supporting its outer end by an additional shoe, E, substantially as and for the purpose herein shown and described.

2d, The application of the wire braces, c c, below the netting of a wire screen, D, for the purposes set forth, and substantially as herein shown and described.

66,189.—WATER WHEEL.—Ebenezer Tuttle, Canaan, Maine.

I claim the regulator, C, and disk, D, arranged in relation to the gate, G, and wheel, A, substantially as and for the purpose set forth and described.

66,190.—FEED BAG.—John Vandercar (assignor to T. S. Sperry), Brooklyn, N. Y. Antedated June 20, 1867.

I claim the internal bag, E, extending downward and inward from the top of the structure, and provided with the spring, e, arranged to operate relatively to the internal bag, E, and to the perforated exterior casing, B, substantially as and for the purpose herein set forth.

66,191.—SIGNAL LAMP.—Joseph Wall, New York City.

I claim the box, A, having cases, B, fitted in it, provided with different colored glasses, a b c, and an opaque or dark section, d, and inclosing lamps or lights, the cases being placed before openings in the box, and all arranged substantially as and for the purpose specified.

I further claim the placing of the box, A, on a revolving stand, constructed and arranged substantially as and for the purpose set forth.

66,192.—MACHINE FOR FEEDING NAIL PLATES.—W. Wallick, (assignor to himself, S. F. Prince, and H. K. Smith), Philadelphia, Pa.

I claim, 1st, The nippers, L, constructed substantially as described, in combination with the devices herein set forth, or the equivalent to the same, whereby the reversing and reciprocating and vertical vibrating motion are imparted to the said nippers, as and for the purpose herein set forth.

2d, The said nippers, L, having the above specified movements in combination with a bed plate, F, by which the nippers are carried, and with the devices herein described, or their equivalents, by which the said bed plate and its nippers are advanced at uniform intervals for the purpose described.

3d, The recessed brackets, S S, or their equivalents, for holding the strips to be converted into nails, in combination with the sliding frame, T, and its shoulder and the mechanism described, or its equivalent, for operating the frame and causing the latter to move the lowest of the strips within the range of the nippers, as set forth.

4th, The nippers, constructed substantially as described and connected to the spindle, J, in combination with the cam-like plate, P, hung to the said spindle and operated by the moving bed plate through the mechanism described, or its equivalent, so that the said plate, P, may open the jaws of the nippers and permit the same to be self closed, in the manner and for the purpose specified.

5th, The segmental pulley, I, carried by the moving bed, F, and arranged to operate the spindle, J, through the medium of straps, q and q', or their equivalents, in combination with the vibrating plate, H, and its pointed projection.

66,193.—FLEXIBLE COUPLING.—N. W. Wheeler, Brooklyn, N. Y.

I claim, 1st, The combination of the coupling heads, B B, chock pieces, f f f f, and clamp rings, D D, substantially as and for the purposes described.

2d, In combination with the above dividing and constructing the chock pieces, f f f f and f2 f2 f2 f2, substantially as and for the purpose described.

66,194.—SURFACE CONDENSER.—N. W. Wheeler, Brooklyn, N. Y.

I claim the combination of the above described discharge nozzle with a surface condenser.

66,195.—WASHING MACHINE.—H. W. White, Olney, Ill.

I claim, 1st, The roller washing machine, B C D E, provided with attaching devices to secure it within a common wash tub, substantially as described.

2d, In connection with the above I further claim the pressure device, F G H J, in combination with the rolls, D, and frame, B B', as and for the purpose specified.

66,196.—PLANTING HOE.—Augustus Williams, Sebec, Me.

I claim a planting hoe composed of the parts herein shown and described when combined and arranged to operate substantially as and for the purposes set forth.

66,197.—SUPPORT FOR ELEVATED RAILWAYS.—F. A. Williams, Clovesville, N. Y.

I claim the construction of the posts, A, consisting of a combination of the bed plate, D, central post, C, side supports, E, and braces, F, with the sleeper, B, all made substantially as and for the purpose herein shown and described.

66,198—DOOR STOP AND LATCH.—C. L. Willis, Washington, D. C.

I claim the yielding stop as constructed in combination with a spring catch or hook, operating in the manner substantially as herein described for the purpose set forth.

66,199.—PILL MACHINE.—W. V. V. Wilson, Savannah, Geo. Antedated June 21, 1867.

I claim the adjustable rails, C, in combination with the board, A, and rubber, B, substantially as and for the purpose described.

66,200.—SULKY PLOW.—Israel Wing, Earlville, Iowa.

I claim, 1st, The combination of the inclined tongues, C, with each other, with the double tree, D, and axle, B, substantially in the manner herein shown and described and for the purpose set forth.

Second, The combination of the plow standards, G and H, bars, I, and chains, K, with each other and with the tongues, C, substantially in the manner herein shown and described and for the purpose set forth.

66,201.—PAVEMENT.—C. W. Stafford, Saybrook, Conn. Antedated March 27, 1867.

I claim, 1st, The constructing of sections of pavement composed of metallic bands grooved blocks of wood and keys, substantially as and for the purpose set forth and described.

Second, A pavement made up of sections of wooden blocks, substantially as described for the purpose specified.

66,202. — COTTON GIN. — Henry Scattergood, Albany N. Y.

1st, I claim a ginning cylinder formed with circular ribs or projections containing or supporting the teeth, said ribs or projections being elevated above the other portion of the surface of the ginning cylinder and thus leaving grooves for the reception of the guards, substantially as specified.

2d, I claim forming the ginning cylinder of a series of rings, between which, rings or segment of rings containing teeth are secured, substantially as specified.

3d, In combination with a cylinder carrying circular ranges of needle pointed teeth, I claim the guards, R, formed with openings to their upper ends, as and for the purposes specified.

4th, I claim attaching the delivering or doffing roller upon arms extending from the axis of the perforated condensing roller or cylinder so that said delivery roller is allowed to raise and accommodate the thickness of the bat and is kept properly in contact with the condensing cylinder as set forth.

5th, In combination with the condensing roller or rollers formed with smooth perforated surfaces, I claim the screen, V, and brush blower, B, for conveying the cotton to the condenser as specified.

REISSUES.

2,657.—SPIRIT METER.—Joshua G. Allen, Philadelphia, Pa. Patented April 2, 1867.

1st, I claim a meter provided with a series of sample tubes or chambers, arranged to receive and retain samples of the liquid measured, substantially as and for the purpose set forth.

2d, I claim combining with a still two separate meters, so arranged that the high grade shall flow through one and the low grade through the other, independently of each other, as set forth.

3d, I claim constructing the meter, or such portions of it as may be necessary, of glass or other non-oxydizable material, to protect it from injury by acids.

4th, I claim the use of a graduated tube with a hydrometer placed therein, for the purpose of indicating the hight of the liquid, its quality or grade, and temperature, substantially as described.

2,658.—MOP WRINGER.—W. Gillett and W. S. Gillett, Stowe, Vt. Patented Nov. 13, 1866.

1st, We claim as a new article of manufacture a mop wringer composed of two plates hinged together substantially as described, for operation as set forth.

2d, In a mop wringer composed of two plates we claim making one of them stationary and connecting the other with it by a hinge joint or its equivalent, substantially as set forth.

3d, The combination with the stationary and movable plates, of side boards, or a frame to which the stationary plate is permanently secured, substantially as described.

4th, In combination with a mop wringer constructed for operation substantially as described, we claim the braces, or their mechanical equivalents, whereby the said wringer is or may be secured to a tub or other vessel.

5th, The combination with a mop wringer such as described of a foot board for steadying the tub while the wringer is being operated, said wringer and foot board being secured to the tub by braces, substantially as specified.

6th, In a mop wringer such as described we claim forming apertures in the plates for the ready expulsion from between the plates of the liquid expressed from the mop.

7th, In a mop wringer such as described we claim providing one of the plates with a handle to move it to and from the stationary plate, as and for the purposes set forth.

2,659.—MINCING KNIFE.—Helen M. Remington, Springfield, Mass. Patented Feb. 12, 1867.

I claim a hand mincing knife having a shank constructed solid or in sections, and terminating in the radial curved arms, b b, in combination with the blades, c c, so applied to the said arms, b b, as to leave and open central space, the whole constructed and arranged substantially as described and for the purpose herein set forth.

2,660.—HARVESTER.—Wm. N. Whitely, Jerome Fassler, and O. S. Kelly, Springfield, Ohio, assignees by mesne assignments of John Long. Patented Dec. 29, 1857.

1st, We claim the combination in a machine having two independent driving wheels of a single drag bar flexibly connected at its front end with the main frame forward of the axis of the supporting wheels, its rear end free to rise or fall independent of said main frame, and connected with the main shoe by two joints, one forward of and the other in rear of the sickle, for the purpose of affording the cutting apparatus firm support and permitting either end of the same to rise or fall with the undulations of the ground over which it is drawn, substantially as described.

2d, Connecting the main shoe of a cutting apparatus which has reciprocating cutters with a single drag bar flexibly conected with the main frame at its front end, and its rear end free to rise and fall with the undulations of the ground, independent of the main frame, by means of projecting joints, one forward of and one in rear of the sickle, so as to leave a clear space between said joints and beneath said drag bar, through which the cutters' connecting rod may be reciprocated, substantially as described.

3d, The combination of the following instrumentalities in a harvesting machine, viz., two independent driving and supporting wheels, a main frame which carries the gearing, a tongue which may be made rigid or flexible, a single drag bar flexibly connected at its front end with the main frame and its rear end free to rise or fall independent of said main frame, and a cutting apparatus which has reciprocating cutters and is flexibly connected to the rear end of said drag bar so that either end of said cutting apparatus may rise or fall with the undulations of the ground over which it is drawn, substantially as described.

4th, The combination in a harvesting machine which has two driving and supporting wheels and a cutting apparatus which has reciprocating cutters, of a single drag bar vibrating vertically upon a joint at its front end and flexibly connected at its rear end with said cutting apparatus, and a vertically slotted retaining link or plate to prevent any lateral movement of rear end of said drag bar and to limit its vibrations downward so as to support the weight of the cutting apparatus when folded upon the machine for transportation, substantially as set forth.

2,661.—HARVESTER.—Wm. N. Whitely, Jerome Fassler, and O. S. Kelly, Springfield, Ohio, assignees by mesne assignments of John Long. Patented Dec. 29, 1859. Division B.

1st, We claim the combination of the adjustable caster wheel, H', and outer shoe of the cutting apparatus when said wheel is directly connected with said shoe, substantially for the purpose set forth.

2d, The combination of the adjustable caster wheel, H', attached to the outer shoe, with the flexible track-clearing apparatus connected to said shoe inside of said caster wheel, substantially as shown and described.

3d, In combination with the flexible cutting apparatus, the two caster wheels, C' and H', arranged and supporting said cutting apparatus independent of the main frame, substantially as described.

4th, Supporting the heel of the drag bar by the caster wheel connected thereto, substantially as described.

5th, The combination in a harvesting machine which has two supporting wheels, a drag bar flexibly connected at its front end with the main frame and at its rear end jointed to a cutting apparatus which has cutters reciprocated in straight lines, and is free to rise or fall at either end with the undulations of the ground over which it is drawn, independent of the main frame, of an adjustable caster wheel to support the rear end of said main frame when the cutting apparatus is folded for transportation, and a tongue which may be made rigid or flexible, by which the machine may be drawn forward, substantially as set forth.

6th, Giving the cutter bar a reciprocating motion by two cam wheels, J and K, in combination with the reciprocating and rotating connecting rod, M, the whole being constructed and arranged in the manner and for the purpose set forth.

2,662.—PROCESS OF PREPARING HIDES AND OTHER ANIMAL TISSUES FOR THE MANUFACTURE OF VARIOUS ARTICLES.—New England Vulcanite Hide Company, Boston, Mass., assignees of Wm. H. Towers. Patented Aug. 21, 1866.

We claim the treatment substantially as described of animal tissue of any description, or its component elements, fibrine and albumen, or their modifications, gelatine, such animal tissues including raw hide and leather partially or wholly tanned, by combining the same with sulphur or any combination of or equivalent to sulphur, for the purpose of producing the the compound or the effects before described.

2,663.—STEAM DIGESTER FOR TREATING BONES, FISH, AND OTHER SUBSTANCES.—Wm. Perry, North Bridgewater, Mass. Patented Feb. 26, 1867.

I claim, 1st, A steam digester for treating bones, fish, bark, etc., which is made and operated substantially as herein shown and described.

2d, The combination of the suspended retort or digester, A, and the hinged steam caps, d d', on the charging and discharging openings, substantially arranged and employed as and for the purposes herein described.

3d, Also the stopper, m, and the diaphragm, n, in combination with the discharging cap, d', and the ejection pipe, p, arranged and operating substantially as and for the purposes specified.

4th, Also the steam-tight couplings, c and c', on the pipes, b and p, respectively, in combination with the suspended retort, A, for disconnection therewith, as and for the purposes herein described.

DESIGNS.

2,682 and 2,683.—PLATES OF A STOVE.—S. Colly and R. Scorer, Troy, N. Y. Two cases.

2,684.—VISITING CARD.—Samuel W. Francis, Newport, R. I.

2,685.—FOLDING CHAIR.—B. J. Harrison and J. Condie, New York City.

2,686.—PLATES OF A STOVE.—David Hathaway (assignor to to Fuller, Warren & Co.), Troy, N. Y.

2,687.—COOK STOVE.—J. Martino J. Beesley and J. Currie, Philadelphia, Pa., assignors to Marshbank and Martin), Lancaster, Pa.

2,688.—ENVELOPE.—Elisha Morgan, Springfield, Mass.

2,689.—PLATES OF A STOVE.—G. Smith and H. Brown (assignors to Abbott and Noble), Philadelphia, Pa. Antedated May 28, 1867.

EXTENSIONS.

SPIRIT LAMP.—A. J. Walker, New York City. Letters Patent No. 9,751, dated May 24, 1853.

I claim the employment of the plate, B, which serves as a protection against the fluid rising too high and becoming heated and exploding, and also as a support for the inner tubes, in combination with the spiral spring, E, and rod F, the rod serving to connect the said plate with the top of the lamp and the spring serving to hold the plate, B, firmly down on the flange, D, and also to throw up the cap and extinguishing tubes instantaneously after the top has been unscrewed, the whole being constructed, arranged and operating in the manner herein shown and described.

NUT MACHINE.—James Rees and Rob Crichton Exrs. H. Carter, Pittsburgh, Pa. Letters Patent No, 10,249. Dated Nov. 22d, 1853 Antedated June 3, 1853.

I claim the arrangement of the devices substantially as herein described for reducing the end of the blank bar to a given thickness preparatory to severing the blank, whereby nuts of uniform thickness produced from bars of irregular thickness, and the machine is protected against injurious strains.

PAPER FILE.—H. L. Smith, Gambier Ohio, formerly of Cleveland, assignors to H. L. Smith, Cleveland, Ohio, O. and L. Buttles and H. A. Swift, Revena, Ohio. Letters Patent No. 9,776. Dated June 7, 1853.

I claim the paper file herein described with prepared adhesion leaves or margins as a new article of manufacture.

MOP HEAD.—Harvey Murch, Lebanon, N. H. Letters Patent No. 9,781. Dated June 14, 1853.

I claim my improved mop head, composed of the fixed cross head, B, which has grooves in its lower side and in combination with the sliding binder, C, that terminates in a notched shank, c, and passes through the loop, a, on the handle, A, which serves as a detent in consequence of the action of the spring, d, on the underside of the said shank, substantially as herein set forth.

SAWS.—G. N. Reed and P. L. Tuttle, Geneva, N. Y. Administrators of J. H. Tuttle. Letters Patent No 9,807. Dated June 21, 1853.

I claim the combination, arrangement and location upon the same blade, of the setts of fleam teeth for scoring the sides of the kerf and the setts of planing teeth for removing the wood between the scores when said planing teeth are placed back to back curved in opposite directions, and are between the setts of fleam cutters, and at sufficient distance apart, so that each planing tooth shall serve alternately as a gage to its fellow, while allowing it to cut to a proper depth and be a permanent guide to the fleam cutters to prevent any of the teeth from taking two rank a hold upon the wood, which makes it run with great ease and efficiency, and is applicable to slitting or cross cutting, substantially as described.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,192.—MEANS FOR CHECKING AND GUIDING HORSES.—Wm. Clark, Valatie, and Wm. Griffin, Lansingburgh, N. Y. April 24, 1867.

1,265.—BOOTS AND HOES.—Geo. F. Chase, Boston, Mass. May 1, 1867.

1,269.—LOOM.—Erastus B. Bigelow, Boston, Mass. May 1, 1867.

1,283.—LOCOMOTIVE AND TRACTION ENGINE, ALSO RAISING HEAVY BODIES.—Theodore Krausch, Philadelphia, Pa. May 2, 1867.

1,287.—NUTMEG GRATER.—Henry J. Griswold, Boston, Mass. May 3, 1867.

1,299.—BREECH-LOADING REVOLVING FIRE-ARM.—Reuben Drew, Lowell, Mass. May 3, 1867.

1,301.—PORTABLE LAMP AND ILLUMINATOR.—Thomas Crossley, Bridgeport, Conn. May 3, 1867.

1,302.—FIRE ALARM.—Thomas Crossley, Bridgeport, Conn. May 3, 1867.

1,326.—LOCK.—James Brady, Norwich, Conn. May 6, 1867.

1,346.—MACHINE FOR SCOURING OR CLEANING GRAIN.—Peter T. Elting, Buffalo, N. Y. May 7, 1867.

1,358.—COTTON BALE TIE.—Geo. N. Beard, St. Louis, Mo. May 8, 1867.

1,378.—MODE OF LUBRICATING THE STUFFING BOXES OF STEAM ENGINES AND PUMPS, AND OF RENDERING THE PACKING WATERPROOF AND DURABLE.—Abraham Littlewood, Francis W. Bloodgood, and Henry D. Ostermoor, New York City. May 9, 1867.

1,390.—GOVERNOR FOR STEAM AND OTHER ENGINES.—Daniel F. Mossman, Cambridge, Mass. May 10, 1867.

1,448.—METHOD OF MANUFACTURING ILLUMINATING GASES.—Wm. Elmer, New York City. May 16, 1867.

1,449.—BREECH-LOADING FIRE-ARM.—Wm. W. Hubbell, Philadelphia, Pa. May 16, 1867.

1,218.—LEVEL.—Charles Wells, Bridgeport, Conn. April 27, 1867.

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1,375.—COFFEE POT.—Howard Tilden, Boston, Mass. May 9, 1867.

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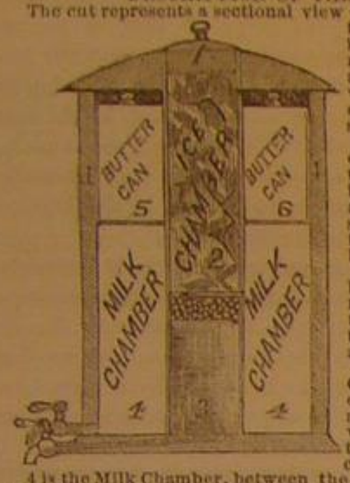
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DESCRIPTION OF THE CAN.

The cut represents a sectional view of the can, showing the arrangements inside. The can is round, in shape and appearance like a water cooler, and can be made of any size required.



1 represents the outer rim, a double tin or galvanized iron case, filled with a non-conducting substance, to keep the cold in and the heat out.

2 is the Ice Chamber—a circular tube, fastened to the bottom and passing through the lid, with a separate lid to it.

3 is the Water Chamber, where the drippings of the ice are collected. The water is drawn from this chamber by a cock.

4 is the Milk Chamber, between the outer rim and central ice chamber; the milk is drawn by a separate cock.

5 and 6 are movable cans, made to fit closely around the ice chamber. These cans are to hold butter, berries, vegetables, or any article needed in a family. They can be taken out either separately or together, or left out entirely if required.

THE ADVANTAGES OF THIS CAN ARE:

First, Its economy in the use of ice. The ice being separated from the water, will last much longer than in an ordinary water cooler, and being in the center of the can, all its cooling properties are saved.

Second, Milk is kept sweet, unadulterated with water, nearly ice-cold, in the warmest weather, in the dining or living room, convenient of access. Buttermilk can be kept as well as sweet milk.

Third, The cans in the upper part of the milk chamber will keep any article used in a family without additional cost for ice.

Fourth, The water filtered from the ice will furnish the family with ice water.

Fifth, This is a compact refrigerator, that will keep any article required in a family, and supply them with sweet milk and ice water at a less cost for can and ice than any other known invention. It can be placed in the dining room, or where the milk is most used, convenient to the servant, and milk can be drawn in large or small quantities as needed.

The attention of Manufacturers and Dealers is called to this valuable invention. There will be no limit to its sale when its advantages are known.

The can was exhibited last fall at the Indiana State Fair, at Indianapolis, and the Illinois State Fair, at Chicago, in both of which it received the first premium, and the commendation of all that examined it.

For a description of this cooler see Scientific American, April 27, 1867, page 276.

The undersigned, sole owners of the above patent, will sell single cans, with the right to use them, or they will sell the exclusive right to make, sell, and use the cans in any County or State, on reasonable terms. For further information address ELDER & BRADSHAW,
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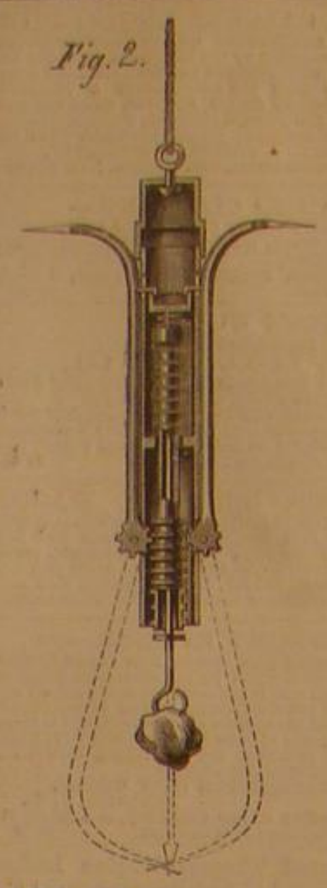
KING'S SPRING FISHHOOK AND TRAP.

The engravings give a correct idea of an improved spring trap patented through the Scientific American Patent Agency, by Jacob King, Jr., of Fort Wayne, Ind., Nov. 20, 1866. Fig. 1 shows the external appearance of the instrument, as set—large figure—and as sprung in the smaller figures. A section exhibiting the interior mechanism is seen in Fig. 2. The outside is a tube having a swivel hook at its upper end, and near the lower projections or ears to receive three hooks. The pivoted ends of the hooks are formed into pinions or segments of gears which engage with a rack cut on the exterior of an inner tube contained inside the outer case. Encircling a portion of this inner tube is a spiral spring one end of which bears against a collar on the end of the tube and the lower end on a projection on the interior of the case. This spring has sufficient tension to spring the hooks down with great force when allowed to stretch after being compressed. Inside the tube is a rod or wire having a hook or ring at its lower end for the reception of the bait, and a hollow disk at the upper end which is held up to position by means of a light spiral spring between the bottom of the disk and the collar on the tube as seen in Fig. 2.

To set the trap the hooks are elevated and a catch on one or more of them passes through the outer case—small apertures being left for that purpose—and engages with the projecting rim of the disk on the bait rod. A very slight pull or movement of the bait overcomes the limited resistance of the small spring, depresses the disk, disengages the hooks, and allows the larger spring to act.

These traps are made of different sizes for fish and also for other game from bears down to mice. The patentee desires to dispose of the entire right. He can be addressed as above.





IMPROVED FISHHOOK AND TRAP.

STATE OF THE PATENT OFFICE.

Now that Congress has assembled we hope that early attention will be given to the condition of the Patent Office, which sadly needs reconstruction.

The work of examining inventions, in many of the most important classes, is half a year, more or less, in arrears. The Commissioner has long had authority to increase the force and bring up the work; but there he sits in his official chair, month after month, day after day, overwhelmed at the complaints, but provides no remedy. If the promises he makes to provide a remedy, but fails to keep, could be represented by broken crockery, and he surrounded with it, the hight of the pile would totally conceal him from view.

A large share of our time as patent solicitors is consumed in writing excuses for grievances occasioned by the incompetence and mismanagement of the Commissioner. In the name of thousands of suffering inventors we appeal to Congress for a speedy correction of the Patent Office abuses. Let a committee of investigation be appointed, witnesses sworn, and all its mismanagement exposed.

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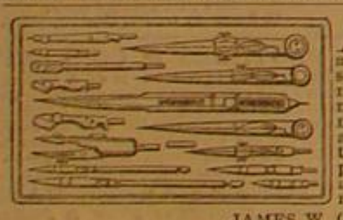
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GENERAL AGENT AND COMMISSION MERCHANT. OPELOUSAS, PARISH OF ST. LANDRY, LA. T. G. COMPTON, Editor and Proprietor of the Southern Sentinel, a paper having one of the largest circulations in the interior of the state, offers his services as above, for the sale of all useful inventions and articles, in a section of country which must necessarily buy largely in that way. He has large storage room, and through his paper can give wide notice of any article consigned to him, and he will pay freight and charges on all shipments of which he has timely notice. References in New York to Messrs. S. M. Pettingill & Co., and in New Orleans, Messrs. Given, Watts & Co., or Messrs. Lee, Crandall & Co., correspondents of McCombie & Child, No. 61 Broad street.

A VALUABLE INVENTION.—A bank lock has recently been patented which possesses some valuable features. It is the invention of Chas. Fiesco, a Rochester mechanic and practical man in the manufacture of safe locks. It is intended to obviate some of the defects of ordinary locks, and to add features which will be recognized by practical safemen as of the first importance. The lockworks are operated by a turning key spindle as usual; but the actuating cam inside supports the parts in such a manner that when the spindle is pressed in the dog cannot touch the edges of the wheels at all, and when drawn out, it can touch but once in a revolution. This is of the utmost importance, for it is by the touch of the dog on the wheels that the burglar and lock pick are enabled to ascertain the position and open the lock. Another valuable feature is the closing jaws which form the bolt, being so arranged that a double stop or shoulder is interposed to remove the strain of the boltwork from the combination wheels. There are no springs to get out of order, and no magnet in the lock. The lock has been on exhibition for some days at Dewey's windows, in the Arcade. The inventor is certainly deserving of much credit for producing so fine a specimen of workmanship.



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SCIENTIFIC AMERICAN

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Vol. XVII.—No. 3. [NEW SERIES.] NEW YORK, JULY 20, 1867. $3 per Annum [IN ADVANCE.]

Improved Governor and Stop Motion.

The object of the improvement represented in the engraving is two fold. It is to aid the governor in its action and also to prevent disasters from the breaking or running off of the governor belt. It appears to be well calculated for both these contingencies.

Fig. 1 is a perspective view of the governor and its attachments complete, and Figs. 2 and 3 are sections of the main working parts. The governor is of the ordinary style, its appurtenances constituting the particular difference between this and ordinary regulators.

A lever, A, is pivoted at B and is connected at its short end with the valve. When the steam in the boiler rises above the proper point of pressure it raises a piston fitting into the pipe, C, which is connected with the steam chest and receives steam directly from the boiler. The steam of this piston, working through a gland, engages with the lever, and when the pressure is too great assists in raising the lever and thus in shutting the valve. A spring, D, on the top of the lever can, by the set screw, E, be tensioned in the required degree as may be found most efficient.

The piston in the pipe, C, will be raised as the pressure of steam increases and act as a weight, or rather as a spring in forcing the valve to its seat. Its action is direct without any intermediate machinery, so that the rise of the steam pressure in the steam chest will show itself at once by means of this piston in closing the valve. Of course a lowering of the steam pressure will be acknowledged by the piston in receding from the lever.

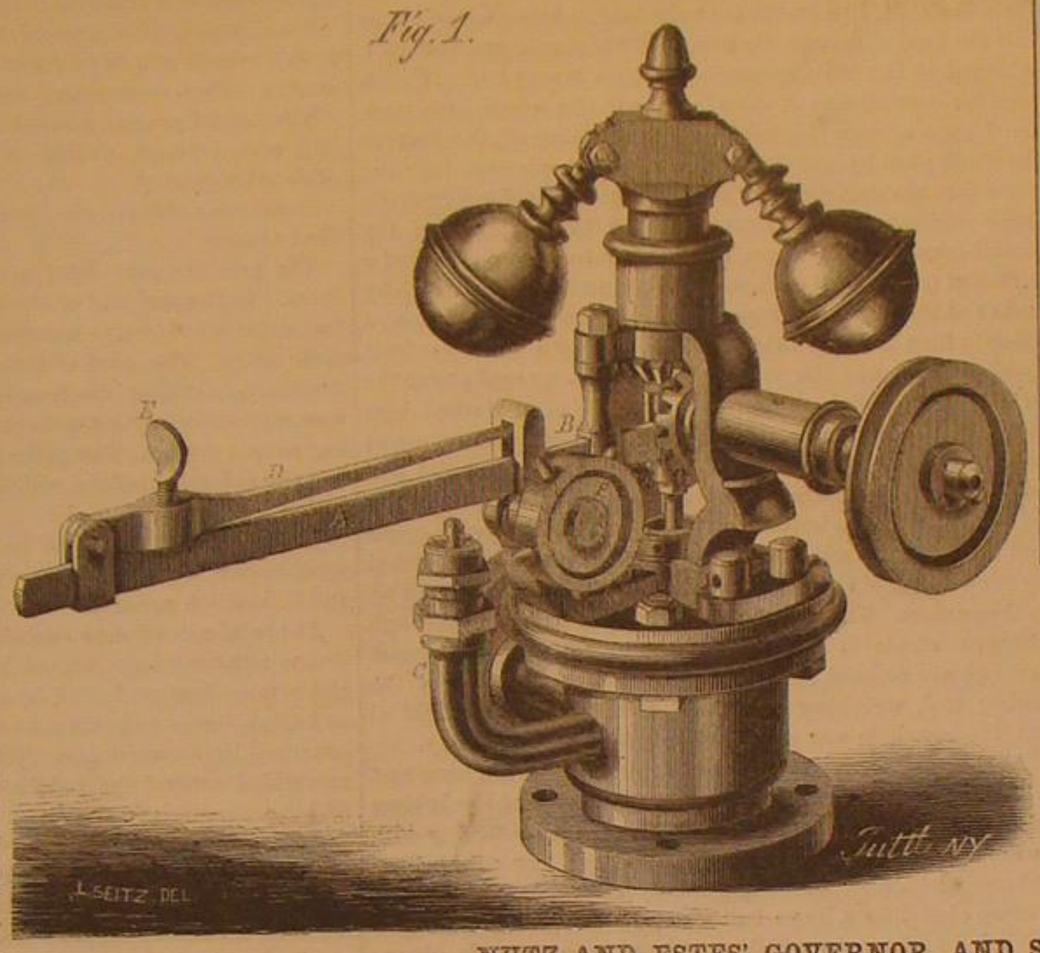
The wheel, F, is a hand-wheel with handles on its periphery Its shaft passes through a stand guide, against the top of which the spring, D, acts and on the shaft is a cam, G, Fig. 2, which by turning the hand-wheel is forced against the under side of the lever either entirely closing the valve or reducing its aperture.

There is also a device forming part of this improvement, for instantly shutting off the steam in case of the breaking or running off of the governor belt. The stand supporting the regulator balls is pivoted to an upright on one side and on the other—the pulley side—the foot rests in a recess formed in a support. This recess has a beveled offset seen in section at H, Fig. 3. So long as the belt pulls in the direction of the arrow the stand is held in position, as at H, but if the belt breaks or runs off, the stand foot drops into the recess, lowering the governor and closing the valve, instantly shutting off the steam.

The whole arragement appears to be well designed for the object intended, and calculated to work certainly and promptly.

A patent will issue next week through the Scientific American Patent Agency. For further information address Wilson Estes & Fairchild, Leavenworth, Kansas.

Fig. 1.



NUTZ AND ESTES' GOVERNOR AND STOP MOTION.

Fig. 2

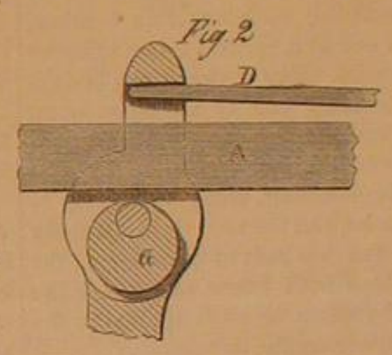


Fig. 3.

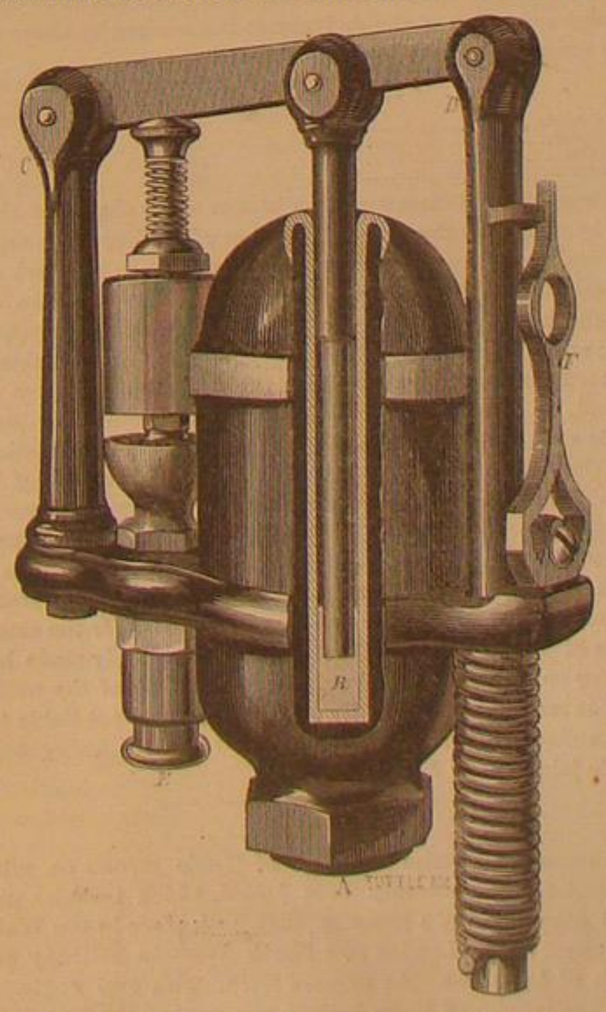


The Flow of Solids.

M. Tresca's paper read at the Paris meeting of the Institution of Mechanical Engineers, was interesting, and it was the opinion of many of those who heard it, that it foreshadowed important improvements in the working of metals. Thus far, we believe, however, no direction in which M. Tresca's researches will have a practical bearing, has been indicated, yet it does not follow that their ultimate results can at once be foreseen. That the particles of solids of which the form is altered must move upon each other, and in the direction of least resistance, is of course a physical law, long known to many. More than twenty years ago M. Remond made silver pencil cases by punching a flat plate of silver into a tube, and drawing this out; and Mr. Parkes, of Birmingham, now makes tubes in this manner. The beautiful process of stamping metallic capsules, is another interesting instance of the flow of solids. The soft metal is placed in a shallow circular recess, and a die, slightly smaller than this recess, is stamped upon the metal, which instantly runs up the die and uniformly around it, to a hight sufficient for the capsule. Cold rolling, cold tube-drawing, etc., are all examples of the flow of solids, and so indeed is all forging and working in heated but not liquified metals, since they are then solids of but moderate cohesion. With the exception of M. Tresca's experiment of forcing a pile of lead plates into concentric tubes, we have long been familiar with much of what was shown by his specimens, especially with the grain of the iron in forgings when brought out by acid. Lead pipe and bullets have long been "squirted" by hydraulic pressure, and Mr. Weems has even pretended that, in pressing an alloy of copper and zinc, he separated those constituents from each other. The most beautiful example in the arts, however, is the latest—the accurate pressing out of a thin tin tube within a lead one, from an ingot of tin placed within one of lead, described a few weeks ago in the SCIENTIFIC AMERICAN—practiced in the new lead-encased tin pipe manufacture, in this city.

PECK'S IMPROVED LOW WATER DETECTOR AND ALARM.

There have been a number of attempts to make an automatic alarm to denote the condition of the water in a steam



boiler, or to give warning of a dangerous position of the water line. Some of them have proved measurably effective, but we doubt if any one possesses more genuine merit than that shown in the engraving, the invention of Milo Peck, of New Haven, Conn., patented January 23, 1866.

As will be seen by the engraving it is not clumsy in form and may be attached to any part of the boiler. A chamber is connected by a pipe at A to the water space of the boiler at a point below which it is not desired the water shall fall. Inside this case is a pipe closed at the bottom, in which fits loosely a piston or plunger the lower end of which rests upon a plug, B, of fusible metal, calculated to fuse at a steam heat but to retain its solidity when surrounded by water. The top of the piston is pivoted to a lever, one end of which is jointed to the stand, C, and the other to the rod, D, which slides through the frame and is held firmly down by the tension of a spiral spring. Between stand, C, and the case is an ordinary steam whistle the valve stem of which rests against the under side of the lever. Steam is supplied to the whistle by an independent pipe leading from the lower part, E, to the boiler.

It will be seen that so long as the plunger rests upon the top of the fusible plug no alarm will be given by the whistle, but the instant the metal softens, so that the spring on D can depress the lever and plunger, the valve of the whistle opens and sounds the alarm. While the case surrounding the fusible metal and its containing pipe is filled with water the fusible plug remains intact, but when, by the lowering of the water in the boiler, the steam is admitted into the case, the fusible metal is melted and the lever allowed to be depressed, the whistle giving the alarm.

A very simple contrivance gives the means of again setting the apparatus without remelting the fusible metal. Pivoted to the rod, D, is a lever, F, the lower part of which is a double cam. It is represented in the engraving as resting upon the stand and the plunger is sunk into the fusible metal at B. In this position the whistle is blown. By swinging the upper end of the lever, F, down, the rod, D, lever, and plunger are raised and the metal, B, allowed to cool and resume its original form. This cooling is effected simply by bringing the water of the boiler up to its proper position, when the lever, F, is replaced into an upright position and its base will remain above the face of the stand until the melting of the metal again allows it to drop.

Further information may be obtained of the inventor and manufacturer, as above, where the apparatus may be seen in operation.

Technical Education.

Dr. Percy, of the British School of Mines, writes in the London *Times*:—Not many years ago, notwithstanding the prominent position which Great Britain then held among the iron-producing nations of the world, scarcely a chemist could be found in any ironwork in the kingdom, and such a thing as an analysis of an iron ore or of iron was hardly ever thought of. What is the fact now? Why, the absence of an expert chemist from a great iron work is the exception and not the rule. I could supply you with the names of able chemists thus scattered throughtout our ironworks. And what is true of ironwork is equally true of other branches of metallurgy. During the last few years I have had the opportunity of seeing the examination papers on metallurgy of working men, sent to the Science and Art Department at South Kingston, from various parts of the United Kingdom, and I say with confidence that at least in that branch, much progress has been made in the diffusion of 'technical education.' I am personally acquainted with many of our chief metallurgical works, and have had ample opportunities of conversing with the working men they employ, and I have been delighted to observe their desire for knowledge concerning the principles of their art, and on many occasions how much knowledge of those principles they have obtained.

BRITISH INVENTION OF TELEGRAPHY IN 1816.—The British Commission have put up in the Exposition a representation of Ronalds' telegraph, with the following inscription:—

"Telegraphy—an apparatus for transmitting through eight miles of wire signals by tension electricity invented by Mr. F. Ronalds, formerly of Hammersmith, 1815."

And in the adjoining window:—

"TELEGRAPHY—an apparatus for transmitting signals by galvanic electricity, invented by Cook and Wheatstone in 1837," subtended by an illustration of a signal-stroke bell—the bell that is now so much used for signalling on railways.

ON THE MACHINERY FOR BORING ARTESIAN WELLS.

The author commenced by stating that the artesian wells at present sunk in the Paris basin of the tertiary formation, range in size generally from about 8in. down to 2in. diameter, with a depth of about 330ft. to 350ft. The bore-hole is usually lined with copper, in order to make the wells water-tight and bring the water to the surface without loss. These works frequently present considerable difficulties in their execution, from the frequent changes in the nature of the soil passed through, and from the impediments that are so often encountered in driving the tubes through the beds of sand and clay. Borings of a much larger size are now in process of execution in Paris for the purpose of bringing to the surface a large supply of the artesian waters, whose existence has been proved by the well at Grenelle of 3¼in. diameter that was sunk in 1841, and the subsequent one of 2¼in. diameter sunk at Passy in 1861. Each of these two artesian wells required six or seven years' work for its completion. A large artesian well is now being constructed by M. Dru, at Butte aux Cailles, for the supply of the city of Paris, which is intended to be carried down through the green sand to a depth of 2600ft. or 2900ft. The boring is at present 490ft. deep and its diameter is as large as 3ft. 11in.

During the last two years and a-half the writer had also been sinking in a similar well of 1ft. 7in. diameter for supplying the sugar refinery of M. Say, in Paris; this well is now 1570ft. deep, and it is expected that the water-bearing strata will be reached at a depth of about 1800ft.

For the smaller wells hand-boring tools are in use, but these are limited to borings of inconsiderable depth and small diameter. For borings of the diameter of these large wells it is necessary to make use of special tools, worked entirely by steam power; and in some cases of sinking mine shafts, tools of as large a diameter as 14ft. 9in. have been used. The boring is effected by a rotary motion in the case of the small diameter and considerable depth percussive action alone i employed, which is effected by raising the tool and letting it fall with successive strokes.

M. Dru illustrated the apparatus he employed in boring the large wells that have been mentione l, by diagrams drawn to a scale of one thirtieth size. The boring rod is suspended from the outer end of a working beam, which is made of timber hooped with iron, working upon a middle bearing, and is connected at the inner end to a vertical steam cylinder of 10in. diameter and 39in. stroke. The stroke of the boring-rod is reduced to 22in., by the inner end of the beam being made longer than the outer end, serving as a partial counterbalance for the weight of the boring rod.

The steam cylinder is single-acting, being used only to lift the boring-rod at each stroke, and the rod is lowered again by releasing the steam from the top side of the piston; the stroke is limited by timber stops both below and above the end of the working beam. A friction break is applied to the drum to regulate the rate of lowering the boring-rod.

M. Dru went on to say that the boring tool is the part of most importance in the apparatus, and the one that has involved most difficulty in maturing its construction. The points to be aimed at in this are—simplicity of construction and repairs, the greatest force of blow possible for each unit of striking surface, and freedom from liability to get turned aside and choked.

The tool used in small borings is a single chisel, but for the large borings it is found best to divide the tool face into separate chisels, each of convenient size and weight for forging, but keeping all the chisels in a straight line, whereby the extent of striking surface is reduced, and the tool is rendered less liable to be turned aside by meeting a hard portion of flint on a single point of the striking edge, which would diminish the effect of the blow.

If the whole length of the boring-rod were allowed to fall suddenly to the bottom of a large bore-hole at each stroke, frequent breakages would occur; and it is therefore found requisite to arrange for the tool to be detached from the boring-rod at a fixed point in each stroke, and this has led to the general adoption of free-falling tools. There have been several contrivances for effecting this object, and M. Dru described and illustrated his plan of self-acting free-falling tool. This tool consists of four principal pieces—a hook, a catch, a pawl, and a disengaging rod. The hook has the chisels fixed in its lower end, and slides between two vertical edges of a box, which is screwed to the lower end of the boring-rod, and the catch works in the same space upon a center pin fixed in a box, so that the tool is lifted by the rod when hooked on the catch. The pall at the same time being opposite the tail end of the catch, secures it from getting unhooked from the tool; but this pawl is centered in a separate sliding hoop forming the top of the disengaging rod, which slides freely up and down within a fixed distance upon the boring rod, being carried by two guides outside the box of the boring-rod, and the hoop rests upon the upper one of these guides. In lowering the boring-rod the disengaging rod reaches the bottom of the bore-hole first, and then being stopped prevents the pawl from descending any lower, and causes the inclined back of the catch to slide down past the pawl, forcing the catch out of the hook, and thus allowing the tool to fall freely and strike its blow; and this hight of fall of the tool will always be the same, being determined only by the length of the disengaging rod.

As the boring-rod continues to be lowered to the bottom of the hole the catch falls back into its original position, and engages with the hook ready for lifting the tool in the next stroke.

The boring-rods employed are of two kinds, wrought iron and wood. The wood for the rods requires to be carefully selected, and care has to be taken to choose the timber from the thick part of the tree, and not the topplags; and in France Lorraine or Vosges deals are preferred.

The boring-rods, whether of wood or iron, are screwed together either by solid sockets or with separate collars. The boring-rod is guided in the lower part of the larger diameter bore-hole by a lantern, consisting of four vertical iron bars curved in at both ends, where they are secured by movable sockets upon the boring-rod, and fixed by a nut at the top: these bars admit of being readily adjusted to any required diameter. In raising up or letting down the boring-rod two lengths of about 30ft. each, are detached or added at once, and a few shorter rods of different lengths are used to make up the exact length required. The coupling screw by which the boring-rod is connected to the working beam, serves to complete the adjustment of length; this is turned by a cross-bar, and then secured by a cross pin through the screw.

In ordinary work, breakages of the boring-rod generally take place in the iron, and more particularly at the part screwed, as that is the weakest part. In the case of breakages of the rods occurring, the tools usually employed for picking up the broken ends are in a conical screwed socket and a claw. Tools with nippers are sometimes used in large borings, as it is not advisable to subject the rods to a twist.

In boring through chalk, as in the case of the wells in the Paris basin, M. Dru stated that the hole is first made of about half the final diameter for 60ft. to 90ft. depth, and it is then enlarged to the full diameter by using a larger tool. This is done for convenience of working, for if the whole area were acted upon at once it would involve crushing all the flints in the chalk; but by putting a scoop in the advance hole the flints that are detached by the blows of the tool are received there without getting broken during the working of the second larger tool. When the boring tool has detached a sufficient quantity of material, the boring-rod is drawn up by means of the drum and rope worked by the steam engine; a scoop is then lowered into the bore-hole by a wire rope from another drum, and the scoop is then drawn up again with the excavated material. This scoop consists of a riveted iron cylinder, with a handle at the top that can either be screwed to the coring-rod or attached to the wire rope; and the bottom is closed by a large valve opening inwards. On lowering this cylinder to the bottom of the bore-hole the valve opens and the loose material enters the cylinder, where it is retained by the closing of the valve, whilst the cylinder is drawn up to the surface. The resistance experienced in boring through different strata is very various, and some rocks passed through are so hard that with 1200 blows per day of the boring tool, weighing nearly 10 cwt., with 19in. hight of fall, the bore-hole was advanced only 3in. to 4in. per day.

As the opposite case, strata of running sand have been met with so wet that a slight movement of the rod at the bottom of the hole was sufficient to make the sand rise 30ft. to 40ft. in the bore-hole. In these cases the writer has adopted the Chinese method of effecting a speedy clearance, by means of a scoop closed by a large ball clack at the bottom and suspended by a rope, to which a vertical movement is given; and each time the scoop falls upon the sand a portion of this is forced up into the scoop and retained there by the ball valve.

M. Dru concluded his interesting paper by pointing out that an artesian well is always some time in settling down to its permanent working state, and when the water first reaches the surface it undergoes considerable fluctuations, being charged from time to time with the substances at the bottom of the bore-hole. The velocity of the flow of water from the artesian wells varies considerably and the following are some examples of the delivery at the surface by those already completed in the Paris basin:—

	Diameter of bore-hole. Inches.	Gallons delivered per minute	Velocity of discharge Feet per minute.
St. Denis	3·28	29	161
Elbeuf	2·95	66	222
Stains	2·95	176	593
Grenelle	3·74	384	698

Borings of large diameter for mines or other shafts are also sunk by means of the same description of boring tools, only considerably increased in size, extending up to as much as 14ft. diameter. The well is then lined with cast iron or wrought iron tubing for the purpose of making it water-tight; and a special contrivance has been adopted for making a water-tight joint between the tubing and the bottom of the well, or with another portion of tubing previously lowered down. This in done by a stuffing-box, which contains a packing of moss. The upper portion of the tubing is drawn down to the lower portion by the tightening screws, so as to compress the moss packing when the weight is not sufficient for the purpose. A space is left between the tubing and the side of the well to admit of the passage of the stuffing-box flange, and also for running in concrete for the completion of the operation. The joint is thus simply made by pressing out the moss packing against the sides of the well; and this material, being easily compressible and not liable to decay under water, is found to make a very satisfactory and durable joint.—*The Engineer.*

Turned Rails.

The second of a series of Board of Trade reports on railway accidents has recently been issued, which includes the official description of a casualty that took place in the Watford tunnel of the London and North Western Railway on the 6th of April last. An express train, with two engines, fifteen carriages, and three brakes, was passing through this tunnel at the usual speed of about 40 miles an hour, when the eleven aftermost vehicles suddenly jerked off the rails. The train was pulled up, and it was eventually found that a broken rail was the cause of this accident, and this rail was a turned rail. The rails of this permanent way, when new, are said to be very good and substantial, and usually weigh 84 lb., being fixed in cast iron chairs, each weighing 35 lb., by means of wooden keys. It is generally admitted that the turning of a rail will cause it to break sooner than it would otherwise do if retained in its original position. Colonel Yolland, R. E., who was appointed by the Board of Trade to investigate the particulars of this accident, considers that the practice of turning rails which is followed on the London and North Western, as well as many other lines, is very objectionable, and very liable to increase the casualties that are due to trains getting off the rails.

PARIS EXPOSITION---AWARD OF PREMIUMS.

The formal presentation of the chief honors awarded by the juries to the exhibitors in the Great Exposition, was made by the Emperor in person on the 1st inst., and was an imposing ceremony. In advance of our own correspondence by mail, we give the few particulars received by Atlantic cable, with the Emperor's speech.

Seventeen thousand persons, including the representatives of every nation on earth, each dressed in their national costume, were present.

The north side of the Emperor's throne was hung with crimson velvet. In front were the members of the diplomatic corps, dressed in uniform.

The French Ministers of State were present in uniform, with Senators and Deputies of the legislative chambers of the empire. They were seated near the throne.

The Lord Mayor of London with several Aldermen of that city, were present, clothed in the red robes of the great English municipality.

Napoleon's throne was guarded by a detachment of the Cent Guards.

The galleries were filled with ladies and gentlemen in full dress. In the east end of the building was placed the orchestra, made up of twelve hundred musicians, an organ and musical bells. The roof of the building was decorated with streamers, showing every color in the rainbow. The nave was surrounded with ample parterre of natural flowers growing as in a garden. The galleries were hung with flags showing the different nations which had contributed to the Exhibition.

In the center, placed on pedestals, were shown the best specimens of each of the ten groups into which all articles in the Exhibition are divided.

At ten minutes before two o'clock in the afternoon a roll of drums announced the approach of the Emperor. The imperial cortege was preceded by squadrons of dragoons, lancers and Cent Gards and trumpeters. The imperial party were conveyed in six carriages. There were thousands of people assembled around the exhibition building at this moment, and the approach of the royal party was loudly cheered by them.

The Sultan of Turkey was present. The cortege of his imperial Majesty was heralded by three carriages containing Turkish officials of distinction, who came before the Sultan's carriage. The vehicle was drawn by eight horses, each horse being led by a servant clothed in rich livery. All these carriages were literally covered with gold, having been brought in from the Palace at Versailles—where they have lain since the time of Louis the Fourteenth—for the special use of the ruler of Turkey. On the Sultan's right hand sat his nephew, the heir to the throne of Turkey, and in front of his Majesty were his son and a second nephew. The imperial foreigners received a warm welcome from the crowd. The sultan saluted the people by passing his hand from his mouth to his fez.

The officers of Napoleon's household, dressed in full uniform, entered the building, and took their places beside the throne.

Next came Napoleon the Third, having the Sultan of Turkey on his right and next to him.

The Empress Eugenie came next.

Her Majesty was followed by his Royal Highness the Prince of Wales, the Prince Imperial of France, the Princess Royal of Prussia, Prince Humbert of Italy, the Princess Mathilde, his Imperial Highness, Prince Napoleon Bonaparte, the Princess Clotilde, the Duchess D'Oste, the brother of the Tycoon of Japan, Prince Von Teck, and his Royal Highness the Duke of Cambridge, Field Marshal and Commander-in-Chief of the British army.

Napoleon took his seat on the throne in the center of the group, having the Sultan on his right and the Empress Eugenie on his left hand.

As the imperial cortege entered the Exhibition building, the orchestra, with a full chorus, gave the Rossini Hymn to the Emperor. The accompaniments were sent forth from cannon and joy bells. The effect was exceedingly thrilling and the music magnificent.

The Minister of State then read to the Emperor the report of the juries on the successful exhibitors and the productions and objects exhibited by them.

At its conclusion Napoleon rose from his throne and, in a loud clear voice, said:—

GENTLEMEN—After an interval of twelve years I come for the second time to distribute rewards to those who have most distinguished themselves in those works which enrich the nations, embellish life and soften the manners. The poets of antiquity sung the praises of the great games in which the various nations assembled to contend with Greece for prizes in the race and other sports. What would they say to day were they present at these Olympic games of the whole world in which the nations of the earth contend by force of intellect alone, and seem to launch themselves forth simultaneously on an infinite career of progress toward an ideal, which has been incessantly approached without ever being able to be attained. From all parts of the earth have come

representatives of science, arts and industry, who have hastened to vie with each other; and we may say that the people and kings have both come to do honor to the efforts of labor and crown them by their presence with ideas of conciliation and peace. Indeed, in these great assemblies, which appear to have no other object than material interests, a moral sentiment always disengages itself from the competition of intelligence, a sentiment of concord and civilization; and the nations in thus drawing near, learn to know and esteem each other. Hatreds are extinguished, and the truth becomes more evident that the prosperity of each country contributes to the prosperity of all. The Exhibition of 1867 may justly be termed universal; for it unites the elements of all the riches of the globe. Side by side with the latest improvements in modern art appear the products of the remotest ages, so that they represent at one and the same time the genius of all ages and nations. It is universal, for in addition to the marvels which luxury brings for the few, it displays also that demanded by their necessities for the many. The interests of the laboring classes never aroused more lively solicitude. Their moral and material wants, education, conditions of life at a cheap rate of living by the most productive combinations of associations, have been the objects of patient inquries and serious study. Thus all improvements march forward. If science, by turning matter to account liberates labor, the cultivation of the mind, by subduing vices, prevails over the vulgar passions, and liberates humanity. Let us congratulate ourselves, gentlemen, upon having received among us the majority of the sovereigns and princes of Europe, and so many other distinguished visitors. Let us be proud of having shown that France, as she is great, is prosperous and free. One must be destitute of all patriotic faith who doubts her greatness, and must close his eyes to the evidence, who denies her prosperity. He must misunderstand our institutions—tolerant even to license—not to behold in them liberty. Foreigners have been able to appreciate this. France, formerly disquieted and casting out her uneasiness beyond her frontiers, is laborious and calm. Always fertile in generous ideas, she is turning her genius to the most diverse marvels, never allowing herself to be enervated by material enjoyment. Attentive minds will have divined that, notwithstanding the development of its wealth, notwithstanding the enticements towards prosperity, the fiber of the nation is always ready to vibrate as soon as a question of honor of the country arises; but this noble susceptibility could not be subject for alarm, for repose would let those who lived a short time among us carry home just opinions of the country. I feel persuaded that the sentiments of esteem and sympathy we entertain toward foreign nations, and our sincere desire to live at peace with them, will be reciprocated. I thank the Imperial commissioners, members of the jury, and the different committees, for their intelligent zeal in the accomplishment of their tasks. I thank also by name the Prince Imperial, who notwithstanding his tender age, I have been happy to associate with me in this great undertaking, of which he will ever retain the remembrance. I hope the Exhibition of 1867 will mark a new era of harmony and progress, assured that Providence blesses the efforts of all who, like us, desire to do good. I believe in the definite triumph of the great principles of morality and justice, which while satisfying all legitimate desires, are alone able to consolidate thrones, elevate nations, and ennoble humanity. (Loud cheering.

After the speech the exhibitors who were to receive grand prizes marched to the front of the throne, each group separately, the first being fine arts. As each name was called, the recipient ascended the steps of the throne, bowing to the Emperor and Empress, received from Napoleon's hand the gold medals. These were passed one by one to Napoleon by Marshal Vaillan, until all the medals were given. Many of the recipients were called up again and received the decorations of the Legion of Honor, the same ceremony being gone through with, as in the case of delivering the medals. The gold medals only were distributed by the Emperor. Altogether there will be 18,500 recompenses to sixty thousand exhibitors. There are sixty grand prizes, nine thousand exhibitors. There are sixty grand prizes, nine thousand gold, three thousand six hundred silver, and five thousand bronze medals, and nine thousand honorable mentions.

In group eight the Emperor of Russia was awarded a gold medal for fine horses.

In group ten, Napoleon himself was awarded a gold medal for a model lodging house. Marshal Vaillant was about handing in to him, when the Emperor beckoned to the Prince Imperial, who came forward, took it from the Marshal's hand and placed it in Napoleon's, amid loud cheers.

The only one with whom the Emperor shook hands was Hughes, the inventor of the printing telegraph.

When all the medals and decorations were distributed the recipients resumed their seats in the nave. The imperial cortege then left the throne and walked around the entire building, passing various groups and occasionally stopping to examine the trophies.

The imperial cortege left the Exhibition grounds in the same manner in which it arrived, with the exception that the Sultan's carriage preceded Napoleon's.

Altogether it was probably the finest pageant that even Paris has ever witnessed.

DARLING, BROWN & SHARPE desire us to state that it was their firm, not J. R. Brown & Sharpe's which received a silver medal at the Paris Exposition.

THE LAKE TUNNEL, at Chicago, is reported to be in successful operation. It furnishes an unlimited supply of pure water, equal to that supplied to any other American city, and the people are delighted.

Correspondence.

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

Off-Hand Sketching for Mechanics.

MESSRS. EDITORS.—The answer to three inquirers in your issue of June 29th, pertaining to the education suited to mechanics, I think goes hardly far enough, and, without repeating any of your recommendations, I would like to add that in connection with mechanical drawing with instruments, or even entirely apart from it, the ability to make correct free-hand drawings or sketches of machines or structures, cannot be too carefully acquired.

Fortunately our American workmen are not tied down by any such restrictions as prevail in England, so that there could be no hindrance to the practice in proper hours, of drawing in this way many details of machines that are within reach of many men in their places of employment.

I believe the best way to begin mechanical drawing is with the use of models and not entirely from other drawings, and for this purpose nearly every apprentice has, within his own reach just the things he needs, perhaps actually in use, so that the relation of each part to the rest is made very clear.

Many inventors would be saved much trouble and expense had they trained themselves in this most desirable accomplishment, as often a contrivance may be quite as satisfactorily studied out and completed upon paper as by a costly model.

Every man connected in any way with mechanical operations should keep a sketch book either in his pocket or at his elbow in his library, (for he ought to have at least a small one,) that even the smallest item of novelty of thought or observation may be noted down for future use; and it is worthy of mention that ideas can often be recorded in this way far more readily and concisely than by mere writing alone.

While it would not be wise to recommend to any one the practice of inventing new contrivances, as a business, yet I do not hesitate to urge every person who thinks at all, to have something always in mind that is susceptible of improvement, and to endeavor, at least in thought, to make the needed improvement, whether it be a detail of construction or a means of better adaptation to the result sought for in the use of the machine, or process, or whatever it may be. P. BARNES, JR.

Trenton, N. J.

Bolt Eaters in Flour Mills.

MESSRS. EDITORS:—I noticed under "Answers to Correspondents," in No. 23, Vol. XVI., "E. W.," of Pa, desires to know how to rid himself of the pest known as the bolt eater. I have waited hoping that some more enlightened miller than E. W. and myself might answer. I will now give my experience which may bring out information for myself and others

I think there can be no way of exterminating them, as they are bred in the flour, but any means which may be designed to keep them out of the bolts, will of course protect the bolts. It is only when the mill is standing that the bug works on the cloth. I do not think it eats or cuts the silk as the moth does woolen cloths, but finding itself confined, cuts its way through always from the inside. Before stopping the mill with the intention of standing two, three, or more days, unslip your buhrs, and at a quickened motion run your mill until your elevators, conveyors, and reels are quite clean or empty. Another point to be observed at all times is, to keep the mill well cleaned. As every miller knows that it is in the dirt and rubbish about the mill that, not only the bolt eater, but many other bugs and worms breed which are so annoying to the miller and quite often to the cook.

JAS. M. ALLEN.

Grafton, Ill.

The Wants of the South.

MESSRS. EDITORS:—A small, compact machine for making cotton rope is much needed in the South. Can you inform me which is the best patent to use for plantation purposes? There would be needed in connection an effective spinning machine for making the thread, unless the rope could be made from the raw cotton directly. What is the value of tripoli, and is it used to an extent to warrant an expenditure of capital and shipment from this state to New York? We have a great variety of minerals in Alabama; among them are gold, silver, copper, lead, iron, marble, lithographic stone, graphite, sulphate of barytes, etc. What is the value of and demand for sulphate of barytes? I understand it is used in the manufacture of white lead. I should like to be put in communication with some person engaged in its manufacture, with the view of ascertaining all the facts connected with the use of baryta and its value. W. C. BINN.

Montgomery, Ala., June 11, 1867.

"Telodynamic Transmission."

This name is given to a system of transmitting power to incredible distances, perfected after many years of baffling experiment and endeavor, by M. G. A. Hirn. It is applied to distribute the power of the Falls of Schaffhausen throughout the manufacturing district around, and is in use in more than four hundred of the factories of Alsace. The method is very simple, yet the application has been attended with almost endless difficulty. The principle is that of transmitting the power in the form of velocity of motion. Endless steel wire ropes are employed for this purpose, running at great speed—10, 20, 30 or 50 miles per hour—over end pulleys 13 or 14 feet in diameter for short distances, without intermediate support; or for long distances, over pulleys of six or seven feet diameter, at intervals of 160 yards. The chief difficulty to be surmounted, has been the mutual destruction of the ropes and pulleys. This was at last prevented by cutting a dovetail groove in the periphery of the pulley, and ramming it with gutta percha. Neither this face nor the rope that runs on it, it is said, shows any serious sign of wear after seven years' work—a pretty tough gutta percha or a pretty tough story.

The first achievement of M. Hirn, was to transfer twelve horse power from a waterfall to a distance of 88 yards; the next, to transmit 50 horse power 264 yards. In 1857, he transmitted 45 horse power 1100 yards. In 1858, 50 horse power 126 yards. In 1859, 100 horse power was carried 1080 yards, and 60 horse power 1320 yards; and altogether, he records more than 400 successful applications of this sort. He has now no hesitation in undertaking to carry power twelve miles, and calculates to lose not over 20 per cent. in the transmission.

THE CONSUMPTION OF SUGAR.

Our name sugar is probably derived from the Bengalee word *shukkur* a term by which it is still known in India. Although Europe did not possess this agreeable condiment to any extent anterior to the discovery of the West Indies, the Chinese were acquainted with the process of manufacturing it from the sugar cane above two thousand years ago. In small quantities Chinese sugar found its way into ancient Europe where it was valued as a medicine. It is not certain at what time the plant was brought into the Western countries, nor by whom the acquisition was made, but we find that early in the tenth century the cane was cultivated in Persia, whence it was undoubtedly carried into Messopotamia, thence to Syria, and by the Saracens introduced into Egypt, Sicily and Spain. Sugar cane is commonly supposed to be indigenous to America, yet it has never been found growing wild on this continent. More probably it was not a native of the New World, but was early introduced by the Portugese discoverers, who perceived that the climate of this country was peculiarly adapted for its culture, and in time it became so flourishing that sugar was re-shipped as a supply for England and France.

The consumption of sugar now varies very much in different countries, and also fluctuates very much with the rise and fall of prices. In 1860, in Great Britain, the average consumption of sugar was 34 lbs. for each inhabitant. The use of sugar in England was probably much above that average, or that of Scotland and Ireland must have increased very rapidly; because we find that in 1856 the consumption of England was 34 pounds, Scotland 21 pounds, and Ireland 8½ pounds—or about 28 pounds average for Great Britain. Sugar is not much used in France, the average consumption for each inhabitant being only 11½ pounds—exactly one third of the average of Great Britain. In Belgium, though coffee is usually drunk without sweetening, 21 pounds of that sugar is disposed of yearly for each inhabitant. Germans generally either do not care for sweets, or are too poor to buy much of them, as the German States generally only average 7½ pounds for each inhabitant. Among the peasantry of Russia sugar must be an unknown luxury, or at least its use by the people must be confined to Holy days and Festivals, for the consumption per head is but 2 pounds a year. Next to the British, the people of the United States use more sugar than any other nation in the world; and if the consumption of molasses and syrup were added to that of sugar in the respective countries, it would be found that the free use of saccharine food was far greater among us than with our transatlantic friends. In 1864, we consumed 32,582,000 gallons of foreign and domestic cane molasses, 20,000,000 gallons of sugar refinery sirups, 9,000,000 gallons of maple sirups, and 16,000,000 gallons of sorghum. In all, our consumption, therefore, amounted to 73,582,000 gallons, or fully 2½ gallons for every man, woman and child in the United States. This amount looks less extraordinary when we find that the consumption of sugar in that year had declined to 21 lbs. per head. On the other hand, it must be remembered that of both sugar and sirup there was an absolute dearth in the South, the greatest sugar State not producing nearly enough for her own wants, and the reduced consumption must be ascribed quite as much to the non-cultivation of the sugar plantations of Louisiana as to the high prices limiting its use in Northern families. The great demand for sirups, however, has been maintained since the close of the war, and is likely to continue. The quantity of sugar used in the United States in 1864 was only 280,500 tuns, but in the following year it had risen to 412,000 tuns, or 47 per cent increase for 12 months; and yet the consumption of foreign and domestic malasses, and refinery and maple sirups was as much in 1865 as in the preceding year, and the yield of the sorghum plant had increased from 16,000,000 to 25,000,000 gallons. If the use of sweets is any sign of refinement, cultivation, or abundance of the necessaries and luxuries of life, these statistics show the United States to be as far ahead of the most advanced nations of Europe, as England is ahead of France, Germany and Ireland.

American Institute Fair.

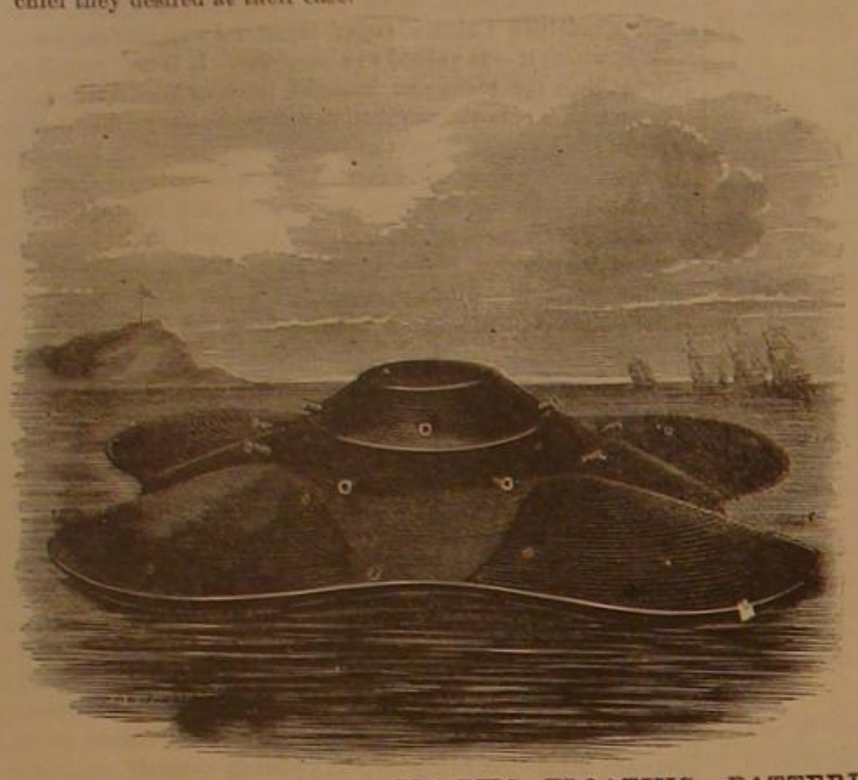
The managers of the Institute announce the opening of the annual exhibition for Thursday, Sept. 12th. Inventors, artists, manufacturers, proprietors of labor-saving machines, and those engaged in agricultural and horticultural pursuits, are invited to send in their best specimens of work and ingenuity. The articles will be classed under the following seven divisions:—Fine arts and education, department of the dwelling, dress and handicraft, chemistry and mineralogy, engines and machinery, intercommunication, agriculture and horticulture. Various medals and the diplomas of the American Institute will be awarded to successful competitors.

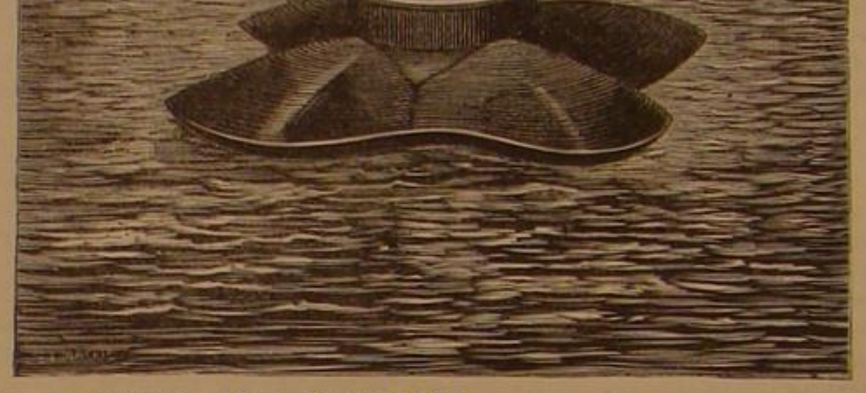
HEMP.—Lafayette county, Mo., is said to be the richest hemp county in the Union. It is estimated that 2,000 tuns were shipped from this section last year.

Floating Batteries, Beacons, and Lifeboats.

From Capt. John Moody, late managing director of the Goole Steam Shipping Company, London, we have received the following communication :—

The use of iron has rendered possible many forms of floating structures which were formerly impossible, and at the same time the requirements of modern naval warfare have necessitated the construction of other forms of floating batteries than ordinary ships. It would be now of very little avail to moor block ships within or in front of harbors for their defence, for such ships would be liable to injury from rams, and, unless thickly plated, would be incapable of resisting the heavy armaments of iron-clads and turret vessels. Moreover, they would require to be stationed in places having considerable depths of water, and therefore it would be possible to get torpedos underneath them, and for an enemy thus to blow them up. At the same time, it is evident that land or shore defences must in any emergency wait to be attacked, and that although their guns might not be silenced, it would only require a certain amount of time for a fleet of iron-clads, presuming them not to be seriously injured by the fire of the forts, to pass the range of their guns, and to effect all the mischief they desired at their ease.

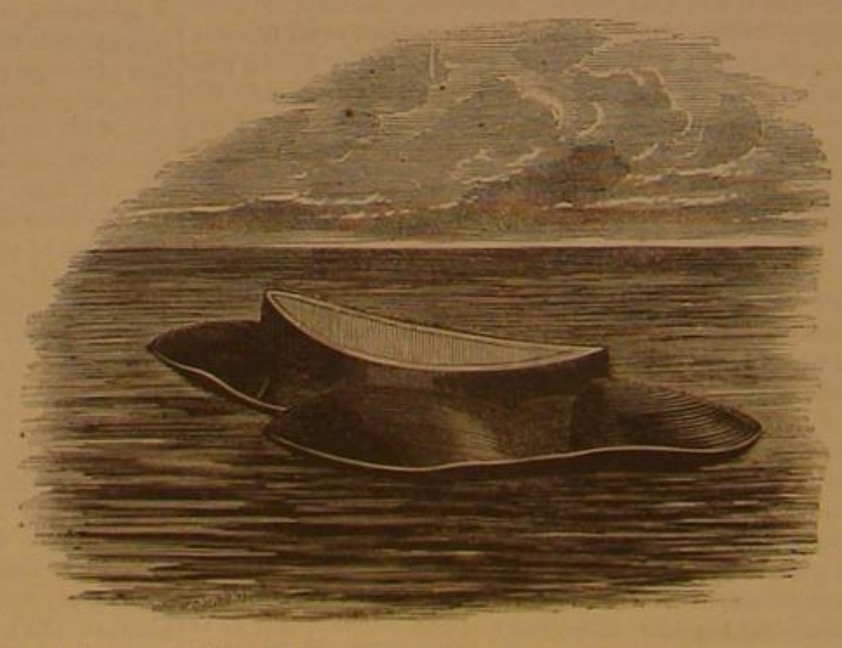




MOODY'S FLOATING BATTERIES, BEACONS, AND LIFEBOATS.

It has become perfectly obvious to all who have properly reflected on the subject that some kind of strong, impenetrable, light-draft floating battery is imperatively demanded for shore, harbor, and river defence, and none, I conceive, will be found to possess equal advantages with the cruciform covered vessels which have been patented by me, and the principle of which is applicable, under certain modifications, equally well for the purposes of floating beacons, ocean stations, and lifeboats.

I propose to construct a floating iron vessel, with four equal rays projecting from a central circular fort; the surfaces of this central dome and its accompanying rays being plated with thick armor, and sloped upward from the edge or circumference of the battery toward the center, at as gradual an angle as may be convenient and suitable for the efficiency of the battery under the conditions under which it is intended to be used. The bottom will be nearly flat, sloping more suddenly upward out of the water to the horizontal line at which the upper and under surfaces meet and form a sharp, projecting, continuous ridge. The draft of water of such a battery would be very light, and by the application of steam power there is no doubt it could be made to glide over the water at a very considerable speed. Plates of enormous thickness could be placed upon its upper surface with very great security and without materially increasing the draft, as the floatage area is enormously great when compared with an ordinary ship, and every foot of superficial area receives a direct vertical support from the water. On account of this extreme buoyancy and the projection of the arms, the pitching and rolling are greatly reduced and almost entirely prevented, while the guns with which the battery is armed being placed over and around the center of gravity, the greatest steadiness of platform is secured.



The primary advantages of its actual fighting capacities are, that its guns can be fired in every direction at the same time, and with equal facility and certainty, so that if surrounded, the battery could fight the enemy's ships on every side, and use all its armament, while broadside ships in attacking it could only bring the guns on one of their sides to bear upon it; and as, so long as the battery's artillery was unsilenced, the boarding of it would be impossible, a cannonade of its iron sides would be all that could be done. Moreover, there is no possibility of approaching the battery in a weak part, as in coming up under the bow or stern of a ship, nor can the battery be raked fore and aft, like ordinary vessels. Moreover, the low inclination of its surface would cause so much glancing of shots, as to diminish greatly the effects of the most violent bombardment.

Against rams, the acute projecting ridge or rim would be a most formidable defence; while the battery itself could in its turn be made use of for ramming, and could be driven north, south, east, west, without turning in the direction of each of its arms against the ships of any fleet by which it might be surrounded. Internally the battery would be divided into a series of water-tight compartments by vertical bulkheads, not only in the arms or rays but the main hull itself, where these bulkheads would join in the center. This method gives security from sinking from partial but otherwise serious injuries, at the same time that it materially increases the strength of the entire structure

The upper arched surface and battery deck being water tight would enable the battery to float, should her bottom be damaged by rocks or torpedos. As the battery is intended expressly to be stationed in shallow water, and as her dimensions would be of very considerable superficial extent, the planting of torpedos underneath her would be an operation of great danger and difficulty for an enemy, who would be subjected during its performance to an enfilade of musketry and grape shot from the central battery over its low, sloping sides. Such an operation must be executed in boats, as ships could not get near to the battery when moored in shoal water. No fear need be entertained of such a battery being boarded, nor could it be flooded during storms, as the port holes could be so constructed as to avoid taking in water, even if the waves broke over the slopes, which they are not likely to do to any extent, as their effect would be taken off by the overhanging of the hull proper above the water line, while the battery itself would be provided with clearing drains on the lifeboat principle, so that if it were actually swamped, it would speedily clear itself.

Furthermore, should it be desirable to give these batteries greater defensive powers, a central tower, with one, two, or three fighting decks, could effectively be added; and all the weight of such a tower tending toward the center of gravity of the structure, the battery would still be maintained in perfect equilibrium by its projecting rays; and not only could larger guns in greater numbers be put upon it, but they would be carried with far greater steadiness than they could be in any ship—and steadiness of platform is, as every one knows, synonymous with accuracy of fire in naval engagements; while the readiness with which, by the use of her engines, such a floating battery could be rotated on its axis, would enable each one of its circle of guns to be trained upon an enemy with the greatest precision.

The advantages claimed are: great floating capacity, and light draft of water; capability of receiving very thick armor-plating, and for carrying the heaviest guns of the largest caliber; adaptability for river and harbor defences; great protection from damage from breakers and on lee shores, and easiness of again floating, should they take the ground; adaptability for landing troops and war materials up rivers, adaptability for pontoon etc.; bridges for crossing rivers; protection to life, in being able to land troops and cross rivers in face of an enemy, as well as being able to load guns under cover of its protecting batteries; safety from "rams," it being impossible for vessels on the "ram" principle to sink the battery, on account of its peculiar construction and sharp edges; great space for magazines, store-rooms, hospitals, and other purposes in the arms of the battery, all of which are built in water-tight compartments; safety from sinking and availability for defence (until all four arms are destroyed) in consequence of being built in water-tight compartments from the deck to the lowest keel; safety from sinking, should it fill with water, owing to its self-emptying apparatus and contrivances; great saving of expense to the country in forts and other permanent defences, at the same time that greater protection would be afforded to inland towns on tidal rivers and to harbors, as owing to their light draft of water these batteries may be pushed beyond the reach of ordinary warships, whether broadside or turret, and even of gunboats, and should they ground on an ordinary bottom they will take little or no hurt; lastly, the important facility for mobilizing defensive power on any part of our seaboard or in harbors or rivers.

Beside the value of the invention for war purposes, its principal has applicabilities of large commercial value, especially for ocean telegraph stations, floating light ships, and for lifeboats.

With regard to telegraph stations: if cables were made in lengths proportionate to the distances between the sites where such vessels could be safely moored, the general security of the line of telegraph would be advantageously increased, while ships on their voyages could dispatch messages ashore in either direction, and the revenue from this source would probably be very considerable.

Such ocean stations might further be made to serve the purpose of store houses for ships whose provisions had run short, and for places of refuge for mariners whose vessels were disabled or sinking; and lastly, they might also form ocean post-offices, where vessels might call for and leave letters.

For light houses the principle is capable of very successful development, as towers of considerable hight could be built and maintained with very great steadiness upon such a stable platform.

For lifeboats the principle cannot be too highly estimated. Existing lifeboats are of a most dangerous character, from being constructed on an entirely erroneous principle. They are said to be constructed expressly for the purpose of righting themselves when upset. The proper principle for a lifeboat is the impossibility of upsetting at all; and this may be well effected by giving greater length to two of the rays, so as to produce something like a boat-shaped form, while the lateral rays will still maintain a sufficient spread, and consequent bearing upon, the waves, as to prevent my lifeboats from overturning. Even if it were possible to upset my lifeboat, there would still be sufficient air coming in through the clearing valves to support the life of the crew and passengers beneath, and with clinging lines attached inside the boat, those so confined might be securely held on. Steam or manual power could also be efficaciously applied for propulsion, and thus oars and sails, so difficult to manage in boisterous weather, could be entirely dispensed with. Sails, however, could be used when required, and when used, the boat could be prevented drifting to leeward by the use of a movable well-keel.

Another advantage of my lifeboat would be, that when lowered at the ship's side, the projections at its sides would act as fenders, and prevent the occurrence of accidents to life and limb which so frequently happen by the jamming of the boat against the ship when taking on board passengers and crew in a stormy sea. And further, it may be mentioned,

that a lifeboat on this principle cannot be swamped like an ordinary boat by the bearing down of any projection from the ship's hull upon the gunwale, for if the wing of my lifeboat were so jammed down, the leverage of the opposite wing would tend at once to draw it up, and the lifeboat would be squeezed away, as it were, between the projection and the water, and would naturally draw out of the dangerous position.

Capt. Moody is now in this country and may be addressed in care of R. H. Emerson, Etna, La Fayette county, Wis.

BAKER'S METALLIC BAG FASTENER.

The accompanying engraving presents a view of a simple metallic fastener for closing the mouths of bags, sacks, etc. for holding grain, meal, flour, and other substances. It is always ready, and never out of order; can be readily attached and detached, and will last a life time, while its cheapness is one of its best qualities. It is merely two segmental strips of hard rolled brass connected to a joint of wire passing through the bag and being held by a strip of leather inside and by the bending of the ends of the wire. One end of one of these segments has a catch made by punching a section through the band and bending it into a hook on the inner side, while the other segment has a series of holes punched through it for the reception of the hook. The upright bag in the engraving shows the band fastened and encircling the mouth of the bag like a collar, and the empty bag shows the segments unfastened and hanging loosely.

By the method of attaching to the bag—a wire passed through the ends of the two segments, the bag, and a reinforce of leather, with the two ends brought down and toward one another—the contrivance is very securely fastened so that it is impossible that it should give way; yet, at the same time it can be readily removed, if desired, by simply unbending or straightening the wire. This fastening is very light and will outlast the life of the strongest bag. It is always in place when required, and never, like a string, wears out.

The patentee is ready to give a practical test of the usefulness of his invention to all who desire it. He will sell manufacturing and territorial rights, or the entire right as desired. Patented through the Scientific American Patent Agency, June 11, 1867.



For further information address D. B. Baker, Rollersville, Sandusky Co,, Ohio. See advertisement on another page.

Pneumatic and Telegraphic.

The failure of metropolitan internal telegraphs to compete in despatch with the slowest of foot messengers, is bitterly complained of just now in New York. The same evil was felt in London and remedied by a short pneumatic tube, (so far as it went) fifteen years ago.

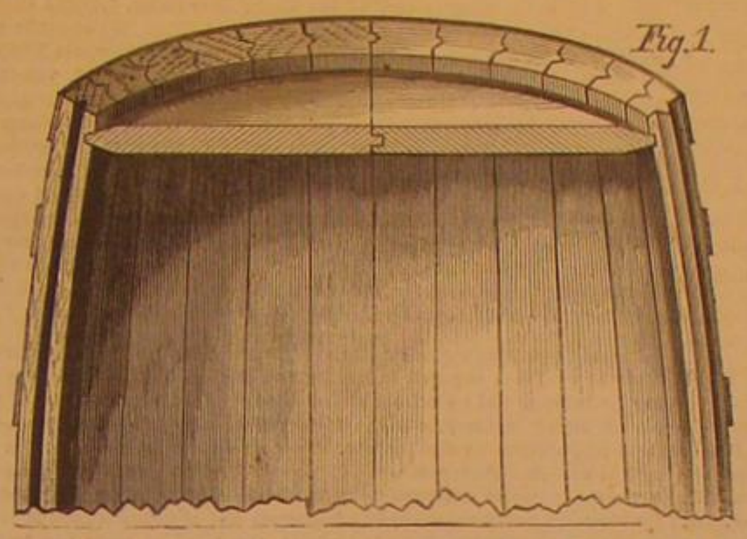
It was found where offices cluster around the great marts of commerce and haunts of business men within a limited area, like the Corn, Royal and Stock exchanges, that without an immense number of wires and apparatus, and a very large staff of clerks, no advantage was gained by sending messages by wire for such very short distances. Indeed, it was found more practical to forward messages by foot-messengers. Mr. Latimer Clark solved this problem in 1852, by proposing the establishment of a pneumatic tube. Such a tube was fixed between the Electric Company's central station, Lothbury, and the Stock Exchange in 1853. The system was subsequently extended to Cornhill, Mincing-lane, etc., and received great development. It has worked most admirably, and the success of Mr. Clark's system has produced successful copyists in Berlin and Paris.

The advantages of this system have been readily appreciated and very fully carried out in Paris. Mr. Latimer Clark adopted lead tubes one and a half inches in diameter, protected by externally split wrought-iron pipes. Messrs. Mignon et Rouart, the clever adapters of this system in Paris, use wrought-iron pipes of nearly the same diameter, but of great length, glazed in the interior, and connected by union joints rendered air-tight by caoutchouc. Their carriers are either of metal or leather, and a fare allowage of windage, and fitted with air-tight collars. They are made short so as to take the sharp curves which are necessary in going round the corners of streets. The pipes are buried beneath the surface, or carried in the subways, like the ordinary gas or water pipes. The mode of employing the pressure in the ordinary waterpipes, for compressing the air, we have already described in the SCIENTIFIC AMERICAN.

MERRILL'S IMPROVED CASK.

The advantages of this method of forming the staves for casks is apparent by a glance at the accompanying engravings. It consists mainly in tongueing and grooving the

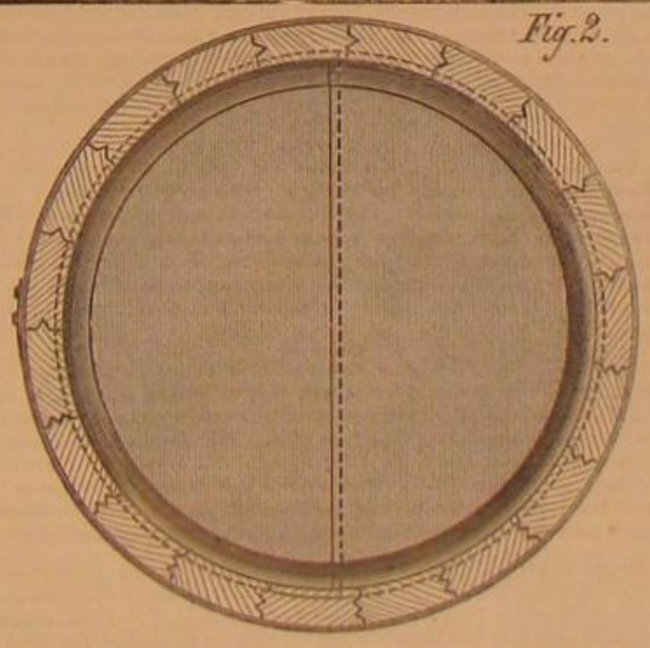
Fig. 1.



edges of the staves with a single or double V-groove. This gives a much larger amount of contact between the surfaces, and thus diminishes the danger of leakage when the contents of a cask are of a volatile nature. It is well known that with the ordinary barrel, even if thoroughly coated internally with hot glue, crude or distilled petroleum will find its way to the outside, and thus leakage and waste made a large item of loss in a cargo of oil. With barrels make on the plan shown in the engravings it is claimed that petroleum has been shipped to Australia, California, the Cape of Good Hope, Malta and other parts of Europe, without losing any oil, landing their contents intact and in perfect order.

Fig. 1 shows a longitudinal section of a barrel with the staves having a single V-groove and tongue, and Fig. 2, the head of a cask, half of the staves having the single and half the double groove and tongue. The tongues are made slightly larger than the grooves so that when trussed and hooped, the parts shall come into very close contact. The edges of the staves are glued by a revolving brush which turns in a kettle of dissolved and heated glue, then put together and trussed and hooped, either by machinery or hand. After the barrel is thus put together it is glued internally by pouring in a quantity of hot glue and rolling and shaking about until every part of the interior surface is coated and thus rendered perfectly impervious to oil, alcohol, or spirits of any kind. Casks built and treated in this manner are so well secured that if the hoops are all removed the barrel can be rolled and moved violently about for a long

Fig. 2.



time without starting the joints. These barrels are now being largely made and used by the Downer Oil Company at their works in Corry, Pa.

Patents for this improvement were issued to Joshua Merrill in May 1866, who can be addressed at 108 Water street, Boston, Mass., for machinery for tongueing and grooving and for manufacturers' and territorial rights.

The Spakowski Night Signal.

Commander Colomb and Captain Bolton's systems of flashing signals, the longer or shorter flashes corresponding to the dots and dashes (- — ——) of the Morse telegraph code now well known. A new signal light, Spakowski's, just introduced for trial into the navy, promises to give great extension to this system of signalling. It enables the light to be readily seen, even in hazy nights and without night glasses, at a distance of seven miles. The instrument itself weighs seven pounds, and is about three feet in length. The staff, of about two inches diameter, is a hollow cylinder, inside of which is fitted a piston that can be pressed down to two separate distances in the cylinder, but which, when not in use, is kept in the upper portion of the cylinder by a strong spiral spring in the lower part of the cylinder or staff Immediately over the top of the piston, and at the upper part of the cylinder is a projecting nozzle-pipe, through which the air finds entrance on the opening of a valve, by drawing the piston downward The upper portion of the cylinder is now full of air, which will be driven out on the piston being released by the operator's hand, and left to the upward pressure of the spiral spring underneath. Let us look at the upper portion of the instrument first. Here a cotton wick is burning from a small spirit-of-wine lamp fixed in the head of the instrument. Opposite to the flame of the lamp is about an inch of horizontally fixed brass tubing, of about the thickness of whip cord, terminating in a needle point from another piece of the same tubing, one being the continuation of the other, and pointing direct at the spirit flame. A reservoir in the head of the instrument contains a little over a half a pint of petroleum, and this reservoir is connected with the two small pieces of tubing, and by means of them subsequently with the air from the cylinder below. Now the piston being released, it is driven upward by the spring underneath, and forces the air through the small tubes in the face of the flame and with it the petroleum in the form of vapor. The result of this is a column of flame of full two and a half inches in diameter, which darts upward from the point of contact be twe-n the petroleum vapor and the flame of the lamp, and this column of light lasts just so long as the piston is moving upward again to its normal position in the cylinder. The length of time during which the column of light is shown therefore, depends upon the length to which the piston is pressed downward in the cylinder. Thus a two-inch movement of the piston may be said to give a short flash—and a six-inch movement to give a long flash ——. A mechanical catch in the cylinder warns the signalman when he has reached the proper distance for a short or long flash.—*Engineering.*

WATSON'S GIMLET

Every one who uses the common gimlet knows that it is almost impossible to bore a hole with it without splitting the



material; further, in hard woods the tool works very unsatisfactorily, as the screw on the end draws out before the hole is completed. In any case the action of the gimlet is defective from the manner in which it is constructed. It is not a cutting tool but performs its work by crowding or forcing the wood to one side.

The object of this invention is to produce a gimlet that will bore without splitting and cut as true a hole as an auger. To this end the tapering portion is provided with a series of shoulders, *a*, which form cutting edges and remove chips as the screw on the end draws in. The object is attained perfectly and the result is a much better tool at little additional cost of manufacture, and can be applied to gimlets already manufactured, either double or single cut. The advantages of this gimlet are apparent. Patent applied for and the right for sale low. Address Egbert P. Watson, Box 4,436, New York City.

Field's Compound Engines.

Mr. Joshua Field, of the eminent firm of Maudslay, Sons & Field, of Lambeth, England, has recently patented some interesting combinations in the steam engine, which we find in the *Mechanics' Magazine*. His combination of high and low pressure cylinders, is singularly compact and ingenious. The small high-pressure cylinder is let into the forward head of the large low-pressure cylinder, like the joint of a telescope; projecting only far enough to allow the valves to be got at. The piston heads of both cylinders are connected by a rod so that both pistons work as one; and the large piston head is also recessed to fit like a cap upon the inner end of the small cylinder, and so fills the annular space around the latter. The high-pressure steam entering the small or inner cylinder is cut off, say at half the stroke, and allowed to expand into the large cylinder, at the same time completing the stroke of the

compound piston by expansive pressure upon both its heads.

Another form of combination patented by Mr. Field is that of three cylinders side by side with a three-throw crank directly in front of them: the central one being the smaller and receiving the high-pressure steam, which is cut off at half-stroke, expands to the end of the stroke, and is then transmitted to both the large outside cylinders and completes its work.

Again, where steam of a very high pressure is used (say from 80 to 150 lbs.) Mr. Field combines both these combinations; entering a fourth and still smaller high-pressure cylinder into the central high-pressure: the latter receiving the expansion in its annular space thus formed, and passing it on into the two outside cylinders.

Another improvement by Mr. Field, mentioned in the same connection, is a warning indicator to prevent damage to valves, pistons and cylinders by excessive superheating of steam. An alarm whistle or bell is adjusted so as to be released and set in action by a heat-gage placed in the current of superheated steam as it comes to the engine, in case the temperature should rise above a certain point, and at the same time a throttle valve, placed at the junction of the pipe leading from the superheater with the main pipe, is actuated so as to shut off the superheated steam and open the communication direct from the boiler.

BUSINESS AND MANUFACTURING ITEMS.

COTTON, ETC.—As an illustration of the decline which has taken place in prices, brown sheetings which sold June 22, 1865, at 32c., and June 22, 1866, at 26c., were selling in New York June 22, 1867, at 18c. The prices for Manchester denims at corresponding periods were 65, 32½, and 35, and of Granville cassimeres, $2.50, $1.75, and $1.50.——On the 22d of June the wages of operatives in the cotton and woolen mills at Manayunk, near Philadelphia, were reduced 25 per cent. Twelve mills had to stop, the hands refusing to work. ——India exported to England last year 1,847,710 bales of cotton, worth $83,000,000.——It is said that the Sprague will not begin the improvement of their recently acquired property at Augusta, by the building of new mills, until next year, when the first of the proposed four new ones will be erected. These mills will be uniform in size and construction, and will probably be the largest single mills in the country. Steps are now in progress toward building two yards near the site which will turn out 4,000,000 brick in the season, for building the new mills.——For the Utica steam cotton mills a new mill is soon to be erected, which will have 16,000 spindles and 300 looms, and give employment to 350 hands, thus doubling the capacity of the works.

IRON.—The American Steel Company, of Pennsylvania, are erecting extensive works at Connellsville, near Pittsburgh. The main building will be 200 by 120 feet. The manufacture of steel will probably begin in October next. A large number of Prussian iron workers have arrived at Pittsburgh, sent over by the agents of mills in that city as a precautionary measure against "strikes."——The iron works of Cincinnati, embracing eighteen foundries and two rolling mills, employ over 3,000 hands, whose annual wages amount to $2,500,000. The product of these works is valued at $6,000,000. Most of the iron used comes in pigs and blooms from Southern Ohio and Tennessee.—— The McCormicks, of Chicago, will turn out 10,000 reapers and mowers this season.——Roy & Co. are building an extensive butt factory at West Troy.

RAILROADS, ETC.—Gov. Fletcher, of Missouri, has again taken possession of the Southwest Pacific Railroad, in consequence of the failure of the purchasers to meet their payments to the state. The latter threaten to contest the Governor's action.——A town of 600 inhabitants has grown up on the Pacific Railroad within six weeks, supporting a $30,000 hotel, billiard saloons, faro, monte and keno banks, and other necessary establishments.——A survey of the Illinois River has been commenced under government orders, for a projected canal from Chicago to St. Louis, starting from Lake Michigan and extending to Alton, Ill. It is intended to admit vessels of 1,200 tuns burden. ——A cable has been ordered in England for a submarine telegraph between Hong Kong and Shanghai.——The navigation of the Colorado River, lately suspended, has been reorganized and will be resumed vigorously by the "Arizona Navigation Company."——The Pacific and Atlantic Company have completed their line to the city limits of Cincinnati. The Western Union Company are strenuously opposing them in their efforts to procure the consent of the Common Council to their setting poles in the streets of the city. The Western Union Company intend to furnish a refreshment room in the New York office, where their employés can obtain refreshments without being under the necessity of leaving the building.——The consolidation of the American, Southwestern and United States Telegraph companies with the Western Union made the largest stock company in this country, with a capital of forty millions of dollars, representing lines of wires from Newfound land to the Rio Grande, to San Francisco and thence to New Archangel, in the new Russian American possessions, with lateral lines leading into nearly every town and village in the country.

MINING.—The Pottsville *Standard* says the development of black band is still progressing, and new localities are opening to demonstrate its general existence as a bed. The striking similarity of the ores taken out at the different openings is of itself sufficient to convince the most skeptical of the great extent of the vein of ore. The Belmont Coal Mining Company's property, consisting of about 1,000 acres, has recently been sold to a wealthy New York Company, who will at once proceed to develop the property for black band and erect furnaces in due time. Those who use the black band ore—the demand for which is greater than the present supply—state that the iron made from it will render the importation of Scotch pig entirely unnecessary. The amount of black band iron ore shipped over the Mill Creek Railroad for the week ending June 8, 1867, was 31·93 tuns; previous, 2,936·08 tuns; total, 2,968·01 tuns.——The Bridgewater, Vt., gold mines are shipping their quartz to Wales to be reduced.

MISCELLANEOUS.—It is reported that one of the largest railroads in the country has adopted the custom of paying its laborers the price of a barrel of flour per week, as the most just and satisfactory mode of measuring the value of labor.——An artesian well about 500 feet deep is being bored at Cohoes, with a view to obtain unusually clear water for the manufacture of a particular grade of paper.——An effort is being made to raise a fund for insuring the lives of members of the Boston Fire Department. Several cities have adopted this wise and benevolent policy. The firemen of Chicago, it is stated, last year had their lives insured by several liberal-minded gentlemen of that city. At a recent fire three were killed and several injured, and the insurers have paid over to the families of the deceased $7,500, while the injured men are given a weekly compensation.——Advices from Sitka, in our new Russian purchase, state that lots are being preëmpted, and there is talk of a City Hall. Sitka contains 500 Russians and 800 Indians.——A grand scheme is on foot in Chicago to build a magnificent system of docks, to extend several hundred feet from shore along the lake for a distance of half a mile. The estimated cost is from $5,000,000 to $7,000,000.——On Saturday, June 22, the United States Treasury held the largest amount of money ever held at any one time since the organization of the government, to wit: $180,000,000, of which $103,000,000 were gold and $78,000,000 currency.——As an illustration of the rapidity with which the conversion and purchase of seven-thirty notes have been pushed forward, it is officially reported that $151,746,000 were taken in by the Treasury Department between Feb. 1 and June 1.——The agricultural societies of Massachusetts are appropriating $50 each for the room rent and tuition of one scholar for each association, to be educated at the State Agricultural College. Committees are appointed to select the beneficiaries.——The trade of the West India Islands is larger than most people have any impression of. Statements prepared by direction of the British government in the year 1866 show that the entire trade of the West India Islands amounted in 1865 to the sum of $410,580,919. Of this sum the trade of Cuba alone amounted to $296,000,000.——The British Board of Trade returns, just published, show a healthy contrast between imports and exports in favor of the latter, very tempting to those Americans who wish to see their country also one of the imperial producers rather than one of the spendthrifts of the world. The total value of imports in the first three months of the present year was £24,281,048, against £26,457,723 in the corresponding period of last year, and £19,253,701 in 1865. The exports in the first four months of the present year amounted in value to £42,881,621, against £46,991,165 in the corresponding period of last year, and £35,635,707 in 1865.——In the new Brooklyn Directory there are 74,000 names, indicating a probable population of 250,000, an increase of more than 15,000 over last year.——The Bank of France has at the present time the largest amount of coin probably ever held by any bank or government at one time, amounting to $156,000,000.

Editorial Summary.

LIVE STOCK IN THE UNITED STATES.—From the returns given by the Commissioner of Agriculture, it appears that on the first day of February, 1867, there were in the country east of the Rocky Mountains, 5,401,263 horses, valued at $429,271,818; of mules, 832,386, valued at $76,094,954; of cattle and oxen, 11,750,957, in value, $349,251,682; of milch cows, 8,384,773, worth $322,039,201; of sheep, 19,985,785, valued at $132,774,660; of hogs, 24,693,534, valued at $134,111,424. The total number of animals is 81,603,521, and of value $1,343,618,739. Illinois supports within her boundaries the largest number of horses. New York ranks next in value owing to the superior estimates given to many fancy specimens, though Ohio stands second in the number of horses owned. In mules, as in cotton, Alabama leads; Mississippi comes next, and is followed by the remainder of the Southern States. Pennsylvania has a very large number of mules employed in her coal mines, but is far behind either of the before-mentioned States. In cattle and oxen, Texas bears off the palm. In sheep raising, Ohio takes the first stand. Indiana, Illinois, and Ohio divide the honor of possessing the largest number of hogs.

DEATH FROM EXPLOSION OF NITRO-GLYCERIN.—On the 9th instant, soon after the workmen engaged in making the Summit tunnel of the Central Pacific Railroad had let off a blast of nitro-glycerin, the foreman of the tunnel, Henry McCarty, went in to see what effect the blast had, or to make preparations for another one. He took a hammer and struck on the rock to ascertain whether it was solid or not. There happened to be a quantity of the explosive combustible in or on the rock, which was ignited by the blow, exploding and scattering fragments and splinters of rock in every direction, wounding him in several places, one piece of stone penetrating his right breast and entering the lung, making a terrible wound. The unfortunate man lived until Thursday, the 23d, when hemorrhage of the right lung took place, causing his death in a short time.—*Sacramento Union of May 29th.*

RUST is removed from metals by plunging the article for twenty-four hours in a bath of muriatic acid diluted with twice its quantity of water. When taken out the metal is to be rubbed well with a scrubbing brush when the oxide will come off like dirt under the action of soap. If any rust still remains, the process needs repeating. When the substance presents throughout the appearance of dull lead, it must be thoroughly washed in plain water and well dried before a fire; the polish may then be restored by a little rubbing with oil and fine emery powder. It is best to prepare the metal by washing with a hot solution of soda before submitting it to the action of the acid, for the purpose of removing any oil or grease. If any trace of acid is allowed to dry on, the metal will absorb oxygen from the atmosphere; hence the necessity of its being well washed in pure water.

THE TUNISIAN PALACE is a beautiful Moorish building; but a palace only in its exterior aspect. Within, though lofty and beautiful, it is occupied by a party of Arabs engaged in the rudest native industries. Two men, squatted on the ground, are weaving in the Arab style, a mat of rushes. Another is working on leather. A jeweler is fabricating with the rudest instruments some rough, but showy ornaments. An old fellow in turban and immense breeches is lying on the ground turning ivory. He has no lathe, but he has fastened his bit of ivory between two pieces of wood so that it will revolve; then with one hand he turns it by means of a sort of fiddle bow drawn across it, while he shapes it neatly enough with a rough looking tool held in the other. The contrast between these rude and primitive methods and the wonderful machinery and manufactures in the palace, is a lesson which covers the whole progress of civilization.

A RUSSIAN ENGINEER exhibits a railway invention which attracts considerable curiosity. The object is to save the power gained in a descent, now lost in the friction of the brakes, with wear and tear, and use it in an ascent. To do this the engineer has attached to the locomotive two very heavy fly wheels. Going down hill they act as a brake, and the force they gather will carry the train up an equal rise, less the friction. Here a model train loaded with water runs down a sharp incline, the water runs off, and the force of the fly wheel carries the train back to the place of starting. In this way a short railway, taking coal down an incline, from the pit mouth for example, could be worked without any power but that gained by each descent of the train.

THE HOOSAC TUNNEL.—The contract just awarded to Messrs. Dull and Gowan, of Chicago-tunnel notoriety, provides for the excavation of six thousand four hundred feet of tunnel at the east end, or over a mile of completed tunnel; also the sinking of the central shaft to grade, which will be about five hundred and forty feet of excavation. They contract to excavate the shaft not less than thirty feet per month, and at the east end not less than ninety-one feet in the same time, the whole work being finished in two years.

THE Austrian Journals state that swarms of poisonous flies have made their appearance in Transylvania, and that more than 100 head of cattle have perished. The farmers are compelled to keep their beasts shut up, and large fires are burning night and day around the sheds to keep off this unwelcome visitation. During one day when the rain fell copiously they disappeared, but as soon as the weather became fine again, they returned. The men in charge of the fires have the greatest difficulty in preserving themselves from their venomous attacks, and find tobacco the best preservative.

STEEL CASTINGS.—Among the novelties in steel from Prussia, displayed in the Exposition, is a locomotive cylinder and valve-casing cast solid in steel—difficult enough in iron, (says *Engineering*,) but in steel very remarkable indeed, as one of the first steps in a new art destined to produce the most important consequences. The cylinder is bored out, to show the quality of the metal, and the bored surface is as sound as the interior of a cast-iron cylinder generally is.

TIN-TYPES, as they are popularly called, are small ambrotypes taken on varnished tin, many repetitions upon the same negative being taken by having a camera with numerous lenses. This necessarily costly apparatus has recently been superseded by a very simple expedient. The sitter is posited opposite a box provided with pieces of looking-glass, in which his figure is multiplied any number of times, and the pictures are thus obtained by a single-tube camera directed toward them.

AN IMPOVEMENT IN WATCHES.—Mr. J. Muma, of Hanover, Pa., writes us that he has made an important improvement in watches. In ordinary watches the isochronous vibration is of the balance are depended upon for keeping up the regular rate. But by reason of increase of friction the vibrations of the balance are lengthened, and for this there has been no simple remedy. Mr. Muma introduces into his watch a second isochronous movement, which he claims will compensate for the variations caused by friction.

MAKING THE DESERT BLOSSOM.—The artesian wells in Algeria, long attempted without success, now number probably about one hundred, delivering five or six million *Litres* of water per hour, and converting deserts into gardens wherever they have been bored. The work is going on, defrayed by tax upon the benefitted population, and is destined to reclaim incalculable wastes. In a single district (Ouled Rir) stretching far South into the desert, and now containing thirty-five wells, 2,000 new gardens have been formed and 150,000 date trees planted. Four military boring brigades, well provided with implements, and with growing skill and experience, are steadily pushing on the conquest of the desert, and with almost unerring success in every attempt.

THE LONDON POST OFFICE in 1865 received and delivered 90,606,000 local letters. The average daily delivery of letters in London at present is about 560,000 of which about half are local and half from abroad. The daily number of newspapers and book packets delivered, is about 55,000. The Postmaster asserts that, if London correspondence continues to increase as it has in recent years, it will soon be necessary to have half-hourly collections and deliveries during certain parts of the day. He also alleges that London local letters are the most profitable that the Post-office handles.

THE ENGLISH RAILROADS rarely cross public roads save by bridge or tunnel, and when they must enter a great city like London they almost invariably run parallel with the tops of the houses. Nothing in these masses of men and mazes of railways so interests and surprises the American as the ever present and conscientious vigilance for the protection of human life. No person is permitted to walk on the track, no idle crowds are allowed to cluster at the stations, and in the few cases where the rail traverses a road on the same level, gates are watched by guards, who allow neither horse nor carriage to cross till the train is out of the way.

THE HONEY ANT OF TEXAS, as described by a Texan newspaper, is about half way between the large and small red ants. Its color is a kind of reddish brown. The honey bag is attached to the posterior part of the abdomen. It is overlaid with thin, dark layers, is about half as large as a grain of rice, and contains a "pure clear honey of a most delicious flavor." Whether these ants have a common store-house, like the bee, our Texan authority does not know.

PREPARATION OF SHEET IRON FOR TINNING.—The usual process, with its manifest disadvantages, of cleansing the surface of the plates in the "black pickle," consisting principally of sulphuric acid, has been superseded by an English manufacturer, by scouring between swift polishing rollers in pure water. The surface is greatly improved in quality and polish, and the lurking corrosion left in the pores of the iron by the acid in the former process, is of course entirely obviated.

A REMARKABLE TOAD.—The Pictou, N. S., *Chronicle* records the discovery of an animal, closely resembling a toad, imbedded in a small cavity filled with water, in the center of a seam of coal 160 feet beneath the surface of the ground. The animal is perfectly shaped and quite lively, but at the same time is blind and has no mouth. When put into fresh water it becomes insensible, but recovers upon being replaced in the turbid water taken out of the coal mine. It is now in possession of the American Consul at Pictou.

AT the Royal palace at Berlin, 40,000 wax candles are instantaneously lighted by one single match. The mode of proceeding is simple enough, the wicks being previously all connected by a thread spun out of gun cotton, on lighting one end of which all the candles are lighted simultaneously and thus the whole of the 700 apartments are illuminated at once. In Russia the same method is employed for lighting up the churches on grand occasions.

THE DUNDERBERG set sail on the 4th inst. for Cherbourg, but owing to a slight disarrangement of her starting gear, returned on the following day. Previous to starting on her trans-Atlantic trip she was docked for repairs in Hoboken. The feat of raising this ponderous mass out of water was one of no ordinary magnitude, and it is doubtful if there is another dock in the country capable of sustaining so enormous a weight.

CANKER WORMS.—English Sparrows have been introduced in some of our city parks, and the result is the entire disappearance of the troublesome canker worms. The beautiful foliage of these parks is in striking contrast with former years, and with the worm-eaten trees in some of our avenues, streets, and churchyards, where the sparrows have not yet been introduced.

OIL.—The Pennsylvania oil wells are at their lowest ebb, the whole State yielding less than 6000 bbls. per day. At Philadelphia, lately, 3000 shares of stock, which once brought a large premium and represented an aggregate of $50,000, were sold for $10.

GAS WORKS are to be established in Yokohama, Japan, by an enterprising Yankee.

IT is reported that Krupp has offered his monster cannon as a present to the King of Prussia. It is valued at about £20,000.

Recent American and Foreign Patents.

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

PHOTOGRAPHIC COPYING BOARD.—W. D. Blackman, Defiance, Ohio.—The object of this invention is to facilitate the copying of old pictures, such as photographs, ambrotypes, daguerreotypes, and others by photographic process.

LADLE.—H. W. Benton, Lebanon, N. H.—This invention relates to ladles used for the pouring of metals in casting, and it consists in hanging to the top of the ladle a guard of suitable form, that while allowing the metal to pass or run out it will hold back and retain the dross, skimming it from the surface of the melted metal as the metal is poured.

CHURN.—John F. Brown, New London, Conn.—This invention has for its object to furnish an improved churn, simple in construction, easily operated, readily cleaned and which will do its work thoroughly and quickly.

SEPARATING WATER AND OTHER VOLATILE PROPERTIES FROM PEAT AND OTHER SUBSTANCES.—Thomas George Walker, New York City.—This invention has reference to the manner in which the article peat or other substances may be prepared for use.

CAR COUPLING.—James Depew and J. Darah Hall, Peekskill, N. Y.—This invention consists in an arrangment of parts whereby two railroad cars may be automaticaly coupled together in a safe and convenient manner and uncoupled in the most expeditious manner from the side or platform of the car

RAILROAD CAR SAFETY BRIDGE.—Lester Traxler, Butler, Ohio.—This invention relates to the manner in which a safe and commodious passage way is formed from one railroad car to another.

WATER COCK.—George D. Hadley, Cincinnati, Ohio.—This improvement relates to a new and improved method of constructing water cocks to be used for hydrants and in similar situations.

PLOW.—James M. Hawley, Holton, Ind.—This invention has for its object to furnish a cheap, strong and durable plow, which may be adjusted for use as a single, double or triple plow, and which may be readily converted into a scraper when desired.

ROOFING AND CLAPBOARDING BRACKET.—H. W. Holden, T. J. Moore, D. H. Stratton and Gilbert Reynolds, Blossburgh, Pa.—This invention relates to a new bracket which can be easily applied to roofs of houses, for shingling purposes, or to the sides of houses for supporting platforms for the builders to stand upon, and for many other purposes, and which is so arranged that it will firmly hold itself in position without injuring those boards, posts or shingles to which it is clamped. The invention consists in so constructing the main bracket that it will not only hold itself in position, but also so that a truss for supporting the platform in clapboarding or one for holding the board for shingling can be easily attached to and held in the bracket.

WATER WHEEL.—Thomas Pattinson, Little York, Cal.—This invention relates to a new and improved water wheel, in which the water is applied to the wheel in such a manner as to insure the most favorable results as regards the percentage of power obtained, economy in the consumption of water, and in the construction of the wheel.

MEDICAL COMPOUND.—A. M. Cox, Elizabeth, N. J.—This compound is especially designed for the relief and cure of colds, coughs, and other similar complaints.

PRESSURE FILTER.—Charles N. Brock, Philadelphia, Pa.—This invention relates to a method of filtering and deodorizing sirup, in the process of refining sugar, and it consists in passing the sirup through a battery or succession of closed filtering vessels, under pressure.

PITMAN CONNECTION FOR HARVESTERS.—Hiram L. Wanzer, Clyde, Ohio.—The object of this invention is to reduce the friction of the cutting apparatus and its connections on harvesters; also, to prevent the rattling of the said connections, and their becoming loose by wearing.

BOTTLE STOPPER.—Robert F. Boccmsles, Wallingford, Ct.—The object of this invention is to provide a convenient and perfect stopper for bottles, or decanters, and consists in an India rubber cylinder, of proper shape to fit the mouth and neck of the bottle or decanter, which is fitted around a metal tube for receiving a screw fastened in the head of the stopper. The stopper is inserted in the bottle when the screw is partly withdrawn, and the India-rubber cylinder is elongated by its elasticity, so that it enters easily, and the screw is then turned for the purpose of compressing the India rubber, and expanding it laterally, so that it shall fit in the neck of the bottle tightly, and fill the sides completely, effectually preventing the admission of air or the loss of the contents.

DEVICE FOR SUPPORTING HOP POLES.—Norman C. Roberts, and Ezra W. Badger, Fly Creek, N. Y.—This invention consists in providing for hop poles a chain and ring formed of wire or any other suitable material; the rings being placed over the tops of the poles, and forming a part of the chain which is drawn over each row of hills to support the tops of the poles, to prevent them from surging in the wind, as well as to keep them separated, and in their proper positions.

METHOD OF MAKING ILLUMINATING GAS.—A. C. Rand, Union Mills, Pa.—The object of this invention is to make illuminating gas from benzine and other hydro carbon liquids, by a very simple and compact apparatus, and in such a manner that no fire or other expensive process is employed.

MACHINE FOR FURROWING MILL STONES.—J. J. Zinn, Albion, Pa.—The object of this invention is to furnish millers with a machine for picking the cross furrows or channels of mill stones with perfect regularity and accuracy, and great facility, without laying off the furrows by measurement.

GRADUATING LEVEL.—N. Hollingsworth, Rosetta, Ill.—This invention relates to a leveling instrument, which is provided with a telescope, a needle box and adjusting springs, in such a manner that by means of the needle in the needle box the inclination of the telescope, or its position towards the horizon, can be determined at a glance; and furthermore, the telescope, when adjusted in a horizontal position, can be leveled so that it can be made to swivel in a horizontal plane without being permitted to deviate from its horizontal position. If the telescope is released, it can be readily adjusted to any desired inclination, and an instrument is obtained which can be used with advantage in cross-leveling and in surveying operations of any description.

CORN PLANTER.—Soloman G. Dentler, Orangeville, Ill.—This invention has for its object to furnish an improved machine by means of which the furrow may be opened and the corn dropped and covered easily and accurately.

GATE.—Hiram Turner, Ripon, Wis.—This invention has for its object to furnish an improved gate, strong and simple in construction, and which may be easily adjusted to swing at any hight, to pass over mud, snow, or other obstructions.

STEAM GENERATOR.—William Young, Easton, Pa.—This improvement relates to a new portable arrangement and combination of parts for the purpose of generating steam for various purposes, and the invention consists in arranging a boiler or generator over a fire box and connecting it with a steam drum (which stands above it) by pipes, and also in a device for heating the water before it is pumped into the generator.

GATE.—Cornelius Trexler, La Grange, Ind.—This invention has for its object to furnish an improved gate so constructed and arranged that it may be opened to its full extent without its being necessary to slide the gate back its entire length or swing the entire gate upon its hinges.

HAY LOADER.—George W. Swartz, Newburgh, Pa.—This invention relates to a machine which is attached to and travels with the wagon for the purpose of raising the hay from the ground and depositing the same into the wagon.

BEEHIVE.—S. Hutchinson, North Lewisburg, Ohio.—This invention relates to a new and improved beehive of that class which are constructed in sections. The invention consists in a novel and improved manner of clamping the sections together whereby close joints are obtained, closer or tighter than usual, so that no crevices are allowed in which moth eggs may be deposited. The invention also consists in providing the hive with a bottom composed of an endless space having moth traps and cleats attached and arranged whereby the hive may be kept in a perfectly clean state and the propagation of moth within the hive avoided.

COTTON PRESS.—Samuel D. Roberts, Washington, La.—This invention relates to an improvement in the construction of a cotton press and it consists in an arrangement of double levers operated by a capstan connected with drums, ropes and pullies which work a single vertical follower block for compressing cotton in an ordinary packing box or chest.

SIRUP PITCHER.—John Hyslop and Charles E. Phillips, Abington, Mass.—This invention relates to the cover or lid of the sirup pitcher, and it consists principally in so constructing that portion of the cover which covers the nose of the pitcher that it will enter the said nose and thus as it were cut off the flow of liquid therefrom, consequently not only causing and forcing the liquid to flow back in the pitcher, but also serving to wipe off the liquid from the nose.

REGISTER.—John McLauchlin, Brooklyn, N. Y.—This invention relates to hot-air registers. It consists in the use of a sheet of wire gauze or netting within the body of the register for the purpose of preventing papers or other articles dropping or passing through the register to the fire below, while no hindrance is given to the passage of the heated air.

EXPLOSIVE POWDER.—Gustav Adolph Neumeyer, Duchy of Saxe-Altenburg, Germany.—This invention relates to an explosive powder which is intended to be more safe, but as powerful, as the ordinary powder now in use.

POST.—A. W. Gore, Manhattan, Kansas.—This invention relates to a post for fences and other purposes, which post is made of sheet metal and provided with cross wires having eyes or loops at its ends for securing the ends of the sections of a wire or other fence thereto, or for convenience in hitching a horse, if used as a hitching post.

INDICATOR.—David P. Davis, Jersey City, N. J.—This invention relates to an indicator more particularly intended for use in connection with steam boilers although it can be applied to other purposes. The invention consists in the application to or the combination with any ordinarily constructed or other suitable pressure gage, of a dial or disk of any suitable material for receiving and retaining marks or indentations, which disk is arranged to revolve with a regular and continuous motion and in such a manner as to be marked by a pencil or any other suitable marking device arranged to operate in connection with the said pressure gage and to be thus moved according to the pressure therein over the surface of the said disk either in a straight or a curved line as may be found necessary.

PAPER FABRIC FOR THE MANUFACTURE OF WATER-PROOF INSOLES AND OTHER ARTICLES.—L. M. Crane, Ballston Spa, N. Y.—The invention consists in constructing the fabric of two or more layers of paper with a sheet or sheets of gutta-percha interposed between them.

SCAFFOLD.—Benjamin Best, Dayton, Ohio.—This scaffold consists of a series of upright posts, which are anchored to the ground by means of braces, and on which sliding braces for supporting the platform are arranged in such a manner that the latter can be raised or lowered at will by the parties on the platform. The length of the scaffold can be regulated by the number of uprights employed.

BALING PRESS.—A. J. Purviance, Mount Zion, Iowa.—The nature of this invention consists in combining gearing with windlass and shackle rigging power for compressing and baling hay or cotton.

BALING PRESS.—Wm. B. Smith, Aberdeen, Ind.—This invention relates to a hay press of that class in which the hay, cotton or other article to be baled is held in place by a follower while it is being operated upon by a beater, both the follower and beater moving in a horizontal direction.

PUNCHES.—Lorenz Wolf, St. Jacob, Ill.—The object of this invention is to provide a standard for guiding a sliding punch in such a manner, that the socket in the standard may be enlarged or diminished at pleasure, according to the diameter or size of the tool, which is to slide therein.

THROTTLE VALVE LEVER.—Norman King, Etna, Pa.—This invention relates to a method of operating the throttle valve of a steam engine, and it consists in the arrangement of two levers, which have arms attached and which have their fulcrums upon a stationary standard, and which operate in such a manner that the valve is moved with the greatest ease and can be set or locked in any desired position.

HAMMERS.—Henry Cheney, Little Falls, N. Y.—This invention relates to a new manner of forming the sockets of wrought iron hammers, and consists in making the same of malleable iron and brazing, soldering or otherwise securing it to the head.

DRAY.—F. Van Doren, Adrian, Mich.—This invention relates to a new manner of arranging and constructing the bottom or the bearing surface of dray carts, the same being so arranged as to be removable from the frame of the dray. To one side of the said bottom are secured a series of rollers which when on top, facilitate the loading and unloading of the cart, while, when the bottom is turned around, so that the rollers are on the underside, the dray has an ordinary flat bottom which can be removed with its load and rolled to any desired place within a building.

WATER WHEEL.—Thomas Pattinson, Little Rock, Nevada Co., Cal.—This invention relates to a new and improved water wheel, in which the water is applied to the wheel in such a manner as to ensure the most favorable results as regards the per centage of power obtained, economy in the consumption of water, and in the construction of the wheel.

OXYGEN.—Henri Adolphe Archereau, Paris, France.—This invention consists in a new process for producing Oxygen, industrially on a large scale, by the decomposition of sulphur acid through heat, and in the compression of Oxygen gas, and its utilization to various purposes, chiefly metallurgic.

BAG HOLDER.—Lafayette Turner, Cedar Rapids, Iowa.—This invention relates to a device for holding bags during the process of filling and for closing them when filled. It consists in an adjustable frame set on pins on the ground; the mouth of the bag is folded over the ends and the bag hangs down within the frame, which is then stretched by means of a hinged adjustable cross-piece or bar. A clutch closes the bag when filled, beneath which the string is passed and tied.

CIGAR POINT PERFORATING MACHINE.—Oliver Quinand, Vicksburg, Miss.—This invention relates to a machine for perforating the points of cigars and consists of a block of wood or other suitable material seated on a spring in a hollow block having spikes hinged in its walls, and passing through slots or mortices in the shape of right angled triangles in the walls of the inner block.

GRAIN SCREENS.—Reason Hawkins, Philadelphia, Indiana.—This invention relates to an improvement in the construction of screens for separating the trash and foul seeds of cockle and cheat from wheat and other small grain, and dividing the grain into first and second qualities.

HORSE POWER MACHINE.—John Schley, Savannah, Ga.—This invention relates to an improvement in the construction and arrangement of a machine to be used as a horse power, and is especially designed for plantation use, to be applied to mills and all other purposes.

MANUFACTURE OF SUGAR.—Ursin Naquin and Theodale Morrillson, Parish of La Fourche, Louisiana.—This invention relates to new and useful improvements in the manufacture of Sugar, and consists in a new mode of saturating cane juice and bleaching it with sulphurous acid, for the purpose of making it white bright sugar.

BENDING SCYTHE SNATHS.—O. W. Stearns, Lebanon, N. H.—The nature of this invention consists in machinery for bending scythe snaths, whereby the work is more rapidly and economically performed than by the ordinary method of bending them by hand.

EXTENSION FRUIT LADDER.—John E. Treat, Oxford, Mich.—This invention relates to a new and improved extension step ladder, designed more especially for picking fruit and for general household purposes. The extension feature admitting of the device being used in many cases where the ordinary step ladders cannot be employed.

SCHOOL SETTEE AND DESK.—John Peard, New York, N. Y.—This invention relates to a new and improved combination of a School Settee and Desk, whereby a very cheap and durable article of the kind specified is obtained, and one which will admit of being compactly folded when not required for use, and contain both a book and a slate rack.

HAY RAKE.—Sylvester Johnson, New Harmony, Indiana.—This invention relates to the frame from which the rake is pivoted, made with curved side timbers; to the sash for holding the rake head in proper position while raking; to the combination of a lever, chain or rod, arm and pawls with the rake head; to the formation of notches in the rake teeth, so that the sash may have an inclined position; and to the combination of an arm and link with the sash and arm of the rake head.

MACHINE FOR CUTTING STRAW, &C.—S. Pettinode, Corunna, Mich.—This invention consists in the application of feed rollers to the lever straw cutter; in operating the feed rollers by means of a toothed arm and cogs formed upon the hub of the knife lever, in the combination of ratchet wheels, pawls, connecting rod and lever with the feed rollers and with the toothed arm, in the combination of metallic side pieces with the box frame and upper roller of the cutter, and in the combination of adjustable guide arms, guide rods, and springs, with the metallic side pieces and with the upper feed roller.

MACHINERY FOR MAKING HOT PRESSED NUTS.—Lewis Thierry and Geo. B. Hill, Detroit, Mich.—This invention relates to improvements in machinery for the manufacture of hot pressed screw taps or nuts, and consists of devices for cutting the nuts from the heated iron bar with hexagonal, octagonal or quadrilateral sides, and by an automatic slide moving the blanks over a die and under a punch, which punches out the center hole for the screw, the whole operation of cutting off the blanks and punching the holes being continuous and simultaneous and performed with great rapidity, allowing a whole bar of heated iron to be fed into the machine and converted into blank nuts without intermission or a second heating and without waste of material, except the core from the hole.

COMPOSITION FOR TANNING LEATHER.—A. Westbrook and —— Campbell, Leona, Pa.—This invention relates to a composition for tanning fur skins and glove leather, by the application of which the process of tanning will be facilitated and hastened, and whereby the leather will be made more tough, softer, and more pliable than it can be made with the methods now in use, and whereby stretching and working while drying the leather is made unnecessary, thus saving a great amount of labor, besides producing a superior article.

SUSPENSION BRIDGE.—A. S. Hallidie, San Francisco, Cal.—This invention relates to a suspension bridge which is suspended from strong cables or ropes that are attached to substantial posts or pillars, and which is strengthened by means of suspension rods, which connect the aforesaid cables with the girders, upon which the planking rests, and by braces which connect the cables on each side of the bridge with each other, so that thereby the bridge is made very strong and durable, and capable of sustaining heavy weights, and of withstanding the force of strong gales.

CAR COUPLING.—John Pettengill, Jr., Lisbon, N. H.—This invention relates to a self-acting car coupling, which is so arranged that the link will be held between the elastic sides of the coupling box, so as not to rattle, and is always held firmly in any desired position. Provision is also made that high and low cars can be coupled.

HOLDER FOR BROOMS, ETC.—H. W. Warner, Watertown, Conn.—This invention relates to a holder by means of which brooms, brushes, and other similar articles can be suspended to and upon the walls or sides of a room or other apartment with the utmost ease and readiness, and in such a manner as to offer no obstruction to their being removed when desired for use.

DEVICE FOR TETHERING ANIMALS.—James P. Thorp, Southington, Conn.—This invention relates to a new and improved device for tethering animals, designed more especially for horses, whereby said animals may be allowed a length of rope to admit of them grazing over a considerable area without danger of having their feet entangled in the rope.

MOLDING AND PRESSING BRICKS.—A. J. Sprague, Toledo, Ohio.—This invention relates to a new and improved machine for molding and pressing bricks, and it consists in a novel means for pressing the clay into the molds with a feeding and discharging device, and a guard grating, whereby clay may be molded and pressed into proper form very expeditiously and in a perfect manner.

SKATE.—John Forbes, Halifax, Nova Scotia.—This invention relates to a new and improved fastening for securing skates to the feet, whereby skates may, with the greatest facility, be firmly secured to the boot or shoe, and very readily detached from it when required. The fastening is of that kind in which straps are dispensed with, and the skate clamped to the sole of the boot or shoe.

CLAMP FOR SUSPENDING WHIPS.—Alvin C. Mason, Boston, Mass.—This invention relates to a new and improved clamp for suspending whips when not in use, in order that the same may be kept straight and in proper shape.

SETTEE FOR SCHOOLS AND OTHER PURPOSES.—John Peard, New York City.—This invention relates to a new and improved settee for schools and other purposes, but more especially designed for class rooms in our public schools. The invention consists in a novel construction of the settee, whereby a very strong and durable seat is obtained, and one which may be manufactured at a small cost, and be capable of being adjusted and secured in any position required either against a wall or against a raised platform.

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 advertisements at 50 cents a line, under the head of "Business and Personal."

A. M. R., of Mo.—The amount of heat evolved by compressing air, and of cold by rarifying it, have not been carefully determined by experiment. But there are good reasons for supposing that when 2 cubic feet of air are compressed into the space of one cubic foot sufficient heat is evolved to raise 9½ lbs. of water 1°. If this heat be allowed to escape, the expansion of the air to the original bulk might be able to cool 9½ lbs. of water 1°. The freezing machines constructed on this principle, however have not been successful. The best freezing machine appears to be Carre's which depends for its action on the rapid volatilization of ammonia. Ice is now practically manufactured in all parts of the world; in the frigid and temperate zones by nature, and in the tropics by Carre's machines.

G. R. D., of Mass.—The cast iron to be tinned should be well cleaned by an acid pickle and rinsing in water. It is then dipped in a strong solution of chloride of zinc, and finally in the bath of melted tin. You will find an answer to your other question above.

D. S. H., of Pa.—"I notice that you do not always spell correctly. In spelling a word of three letters, you used two wrong letters and placed the only correct one at the beginning of the word instead of at the end. H. M. T. (page 367 Vol. XVI) enquires: How many revolutions on its own axis will a wheel make in rolling once around a fixed wheel of the same size?" You spelled your answer o-n-e. You should have spelled it t-w-o." Very good! Also E. W. D., of Conn., H. N. S., of Ohio, and T. J. W. of Minn., are not content with our answer. Whether the proper answer be one, or two, depends upon the understanding of the question. A wagon wheel is a reasonable example of a rolling wheel, and we think the question very easily suggests it. Now in a rolling wagon wheel the axis or axle always maintain the same position with reference to the point of contact with the ground. A line drawn on the end of the axle towards the point of contact will always keep its relative position; in rolling around a fixed wheel the line will be directed to the center of the fixed wheel. Now no one will doubt that under such an explanation of the question our answer is the only one admissable. The case which permits the other solution requires that a line drawn on the end of the axle shall be kept parallel with a fixed line, a case which is not so easy to conceive or to put in practice. Now we do not offer this as a complete discussion of the question, for that might fill a whole page of this paper, but rather to show how difficult it is to satisfy all with a short answer. We still think our original answer is the best which can be expressed by three letters.

J. L. W., of Ohio believes that telegraph wires are less liable to oxidation on account of the current of electricity passing through them. He has no faith in the electro-anti-incrustators heretofore alluded to in this paper, but thinks that a current from a battery made to pass through a boiler would be a perfect preventive of incrustation.

E. J. W., of Ill.—A tin vessel will not be suitable for holding your plating solution. If you were to put your solution into an ordinary tin kettle, the silver would speedily be precipitated, and the solution would in time work its way through the metal.

P. J., of N. Y.—A solution of phosphorus in sweet oil or ether, seems to be what you want. The solution shines in the dark when it is exposed to the air. An ounce of it in a two ounce vial would be sufficient to illuminate the dial of a watch or a compass so that it could be read. When the solution is used in a vial, the cork is to be removed for a moment, then replaced, and the liquid shaken. . . . P. J. quotes from an old French book of 1681, a description of a concave mirror two and a half feet in diameter, with which a silver coin was melted, wood set on fire candle light reflected several hundred feet, etc.

D. S. McD., of Ill.—If your shafts are perfectly in line one with the other there can be no question about the running of your belt, if that itself, is straight. Level and line one shaft to the other, which cannot be a very difficult job and you will have no trouble with a belt running on the edge of the pulley. Of course the pulleys must be true and in line with each other.

J. Q. C., of Mass.—Almost any ordinary kitchen utensil, as a quart tin pail with the cover made tight and proper connecting pipes, will be found sufficient to generate steam for your toy engine of 2 inch by half inch cylinder.

C. C. W., of Pa.—The details of the process of producing an artificial skating surface, we suppose have not been made public. Probably some of the artificial stone compounds would be found suitable for the purpose. It is not likely that any imitation of ice can be made so perfect that the ordinary skates can be used on it. All that is required for the roller skates is a smooth hard floor.

J. H. L., of Pa.—The brown powder which you send and which you say is deposited in large quantities from the water of a spring, is mainly oxide of iron. If you heat it to a bright red heat it will turn a permanent red and become merchantable red ochre. The hardened deposit in the neighborhood of the spring, if there is enough of it may prove valuable to you as an iron ore.

J. H. G., of Ky., has a mill at the bottom of a cave 150 feet from the surface. He drives the mill by water of 150 feet head, and wishes to know how much of the water he can return to the surface by means of the mill. The proportion of water that may be returned to hight of the head will vary within wide limits according to the machine employed and the size of pipes. A good turbine might return 80 per cent of the water which drives it.

A. W. G., of Conn., wants a cement insoluble in water to be used with a mass-like paper pulp for the purpose of solidifying it. Shellac or gutta percha have been found useful for such compositions. They become adhesive by heat, or they may be used in solution.

M. B. S., of N. Y., suggests that horse radish may be distilled and used for medical purposes in the room for mustard, etc." The oil of horse radish is isomeric with oil of mustard, and a drop of either applied to the skin will produce a blister. Each contains more than a third of its weight of sulphur.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Good Investment! An interest in one of the best Paper Mills in the West for sale. Address Edward Gandelet, 32 Platt street, New York City.

Wanted—$15,000 at heavy interest, secured by mortgage upon two valuable patents. Address C. E. M., Savannah, Ga.

GREENWOOD CEMETERY ENTRANCE.

Greenwood is probably the most beautiful cemetery in this country, and it is doubtful if it is surpassed in natural beauty or artificial embellishment by any in Europe. The entrance shown in our engraving is a splendid specimen of the florid Gothic, built of brown sandstone from New Jersey. It has two entrances, one for visitors and the other for funerals. These are guarded by a central tower and two side towers, each terminating in lofty pinnacles ornamented with crockets. The buildings on either side are appropriated, one to the reception of visitors and the other to the business of the cemetry, containing offices, etc.



GRAND ENTRANCE TO GREENWOOD CEMETERY, BROOKLYN, N. Y.

The gateway has a clock, and a bell to be used for a passing procession. Over the gateways are recesses on both sides, crowned with the Gothic arch in which are sculptures representing the Entombment of Christ, His Resurrection, the Resurrection of the Widow's Son, and the Raising of Lazarus. These are of Nova Scotia limestone. The shields in the quatre-foils show bas-reliefs of Faith, Hope, Memory and Love; the whole eminently appropriate to the uses of the structure.

The full effect and beauty of this entrance cannot be represented in an engraving. For those of our readers who have a curiosity in regard to this elegant abode of the dead, and who cannot personally visit the locality, we propose, hereafter, to give some idea of its beauties both natural and artificial.

Science Familiarly Illustrated.

Pyrotechnics.

While the recollection of the celebration of our national anniversary is still fresh in mind, it may be profitable to learn how, and of what materials those devices which are judged by some so essential to the proper observation of the day—fireworks—are manufactured. That singular people, the Chinese, were experts in this art long before gunpowder was known among the civilized western nations, and to this day we are indebted to this people for some of our best fireworks and for all the fire-crackers which are used in this country. The Italians were the first to make any attempts at rivaling the Celestials in this field, and the French soon followed the lead. Indeed there is a published account wherein it was proposed, in 1598, employing rockets in war, thus anticipating Congreve by nearly three hundred years. Coming now to more modern times, we find the finest inventions in this line ever made were those of the celebrated Ruggieri, father and son, who exhibited most brilliant and beautiful fireworks in Rome, Paris, and other principal capitals of Europe. The first pyrotechnist of note in this country was William Hall, an Englishman, who appeared at Castle Garden, in this city, some thirty years ago. The leading manufacturers of the country are few in number, the business being dangerous and the demand for this work very light and principally confined to the annual celebration just passed

The materials used in the manufacture are simple enough, niter, sulphur and charcoal forming the prime constituents; black antimony, potash in two or three forms, nitrate of strontia, arsenec, camphor, and verdigris are used at times. Gunpowder is used either in grain, half crushed, or finely ground, for different purposes. For producing pleasing scintillation, filings or borings are employed, and the longer they are the brighter sparks will be thrown out, hence such are preferred as are very coarse, and quite free from rust. Steel filings and cast-iron borings contain carbon and give a brilliant fire with wavy radiations; copper lends a greenish tint to the flame; zinc causes a fine blue color; sulphuret of antimony gives a less greenish blue than zinc, but with much smoke; amber affords a yellow fire, as well as colophony and common salt. Lampblack produces a very red color with gunpowder, and a pink with niter in excess. Yellow sands or glistening mica make golden radiations. Shades of green are produced by adding verdigris, sulphate of copper, and sal-ammoniac. Camphor yields an intensely white flame, and aromatic fumes which overpower the unpleasant smell of other substances; benzoin and storax have also the same property. Lycopodium burns with a rose color and magnificent flame. So much for the materials, and now as to the mode of constructing the different pieces.

The rocket is perhaps, the most important article of fire works, having been made use of as a weapon of war, a signal for ships in distress, and as a means of carrying a line to otherwise inaccessible objects. The rocket case is made with care of the best "tip," or hardware paper, cut in strips, soaked in paste, and rolled around an iron core. As the rocket must fly off with rapidity, its composition must be such as to kindle instantly throughout its length. To effect this, a cylindrical axial space is left vacant, around which the charge is packed. The head is a lighter case attached to the rocket and contains the stars, serpents, or showers of fire, which burst forth when the rocket reaches the end of its flight. A pasteboard tube terminating in a cone, encloses the whole. The stick to which it is fastened, is simply for guiding the rocket in its flight, for without this addition, it would become one of the interdicted "chasers," or "serpents." In firing, the gaseous products violently ejected from the lower end, react with equal force, carrying the rocket forward in the other direction. The stars which are used as garnitures for the skyrocket pots, are small, round or cubic solids, variously compounded, as of niter 16 parts, charcoal 6, sulphur 4, steel filings 3; the materials are mixed with gum arabic and molded into this shape.

Roman candles come next in importance to rockets. The cases for these are made like the rocket cases, though lighter, smaller in the bore, and longer. The composition of the balls is the same as that designed for the rockets. When the ingredients are properly mixed, the mass is molded into small globes with a hole pierced through their centres. Into the case is first placed a lump of clay, then a small charge of gunpowder, afterwards the star; the charges being repeated until the tube is filled.

Pin wheels are made by simply winding a tube of paper filled with explosive compound, around a card board disk; sealing wax, for lack of something better, is used for fastening the coil to the wheel, and from the flame of the lamp needed to melt the wax, or from the melted wax itself, a premature display frequently takes place, with often serious consequences.

Exhibition pieces are ingenious combinations of wheels Roman candles, and brilliant colored fires, the adjoining parts being lighted by quick match strings planted among them, or they are connected by conduits whereby they take fire simultaneously. Electricity was first employed for setting off these pieces, by J. W. Hadfield, one of the leading manufacturers of this city, nine years since, in firing a triumphal piece two hundred feet long, in honor of the successful laying of the first Atlantic Cable.

Blanching of the Hair.

Physiologists have been at a loss to account for the sudden whitening of the hair which is known to be produced by intense and sudden terror or profound grief. Mr. Erasmus Wilson, in a paper recently read at the Royal Society, threw considerable light upon the question The paper was founded on a case apparently unique, in which every hair of the head was colored alternately brown and white from end to end. The white segments were about half the length of the brown, the two together measuring about one-third of a line. Mr. Wilson suggested the possibility of the brown portion representing the day growth of the hair, and the white portion the night growth, and this opinion was corroborated by the remarks of Dr. Sharpey and others of the Fellows who took part in the discussion which followed the reading. Under the microscope the colors of the hair were reversed—the brown became light and transparent, the white opaque and dark, and it was further obvious that the opacity of the white portion was due to a vast accumulation of air globules packed closely together in the fibrous structure of the hair, as well as in the medulla. There was no absence of pigment, but the accumulation of air globules veiled and obscured the normal color and structure. Mr. Wilson observed that, as the alteration in structure, which gave rise to the altered color, evidently arose in a very short period, probably less than a day, the occurence of a similar change throughout the entire length of the shaft would explain those remarkable instances, of which so many are on record, of sudden blanching of the hair; and he ventured to suggest that during the prevalence of a violent nervous shock the normal fluids of the hair might be drawn inward, toward the body, in unison with the generally contracted and collapsed state of the surface, and that the vacuities left by this process of exhaustion, might be suddenly filled with atmospheric air. Dr. Sharpey mentioned a recent example of sudden blanching of the hair, which had been observed by Dr. Landois, of Greifswalde, as reported in Virchow's Archiv., and which was ascertained to be due to the accumulation of air globules in the fibrous substance of the hair.—*Lancet.*

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

☞ 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 on them will be promptly attended to.

☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents or the SCIENTIFIC AMERICAN.

VOL. XVII., No. 3....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, JULY 20, 1867.

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A WORD TO CORRESPONDENTS.

Our system of replies to correspondents is intended not merely as a gratification of a curiosity nor as a means of deciding a dispute, but solely for the dissemination of knowledge which may be useful to a portion, at least, of our readers. It is our intention in publishing replies to questions to answer, in this manner, only those which may benefit others beside the inquirer. The SCIENTIFIC AMERICAN does not assume, in any case, to usurp the functions of the post office. If a question is asked the reply to which cannot interest any one but the questioner, we cannot employ the medium of this journal to forward a reply. If we did, there would be scant room for other more interesting matter in our columns. To all these replies, except such as are evidently trifling, we reply by mail at a large yearly cost for postage, as few of our correspondents seem to consider the demands of business, custom, and gentlemanly courtesy, which require the inclosure of a small sum for postage, paper, etc., where the benefit is all on the side of the inquirer. Where, as in our case, these inquiries count by the hundred weekly, the *onus* is somewhat heavy.

Long communications on subjects which, by our correspondents and our editorial staff, have been repeatedly discussed in our columns, seem to be superfluous; but as we desire to give all a fair hearing, we sometimes feel compelled to reprint the statements which have before appeared, rather than to have any of our correspondents imagine we willingly ignore their attempts to assist in the elucidation of a subject. Of course, we cannot expect entire originality in every communication we receive, and are willing to publish any additional facts which merely throw more light on a subject; but if we published *in extenso* all that is sent on a single subject we should surfeit the mass of our readers. Under such circumstances, it ought not to seem strange that some communications, well written as well as honestly conceived, do not see the light in this paper.

Owing to the number of communications and inquiries, some of which necessitate investigation, labor, and time, they do not appear in the number of the paper in which they are expected. Our room is limited, and some must wait for their turn. Although we have, perhaps, better facilities for ascertaining facts than our correspondents, it must be remembered that no man and no corps of editors can be encyclopedias of scientific and mechanical facts, and frequently we are compelled to spend time and money to procure the knowledge sought.

But no other annoyance is so great as that of endeavoring to ascertain the wishes of correspondents who withhold the data upon which a reply may be predicated. For instance, one of our recent inquirers desires to know the difference between a water wheel of 5 feet diameter with buckets three feet long and one of 6 feet diameter with buckets two feet long. He does not give the description of wheel, whether overshot, undershot, or breast. Another asks, "what proportion of a horse power will a wheel of 6⅝ inches diameter give under 5 square inches of water with a 4 feet head." He does not give the velocity of the water nor the style of wheel to be used. Another wishes to know the actual power of his engine, giving diameter of cylinder, length of stroke, and pressure of steam on his boiler. He does not give the number of revolutions per minute—number of feet per minute of piston—nor the distance of engine from boiler, size of pipe, nor means of exhaust. In all these cases it is impossible to give an answer approximating the truth because we do know the essential facts.

The neglect to use proper terms is another annoyance. When an inquirer asks about *melting* india-rubber we can not understand whether he means melting or dissolving. When one calls for a cement for an aquarium, without stating whether it is a small one to be placed on a table or in a window—in these cases built of iron and glass, or marble and glass—or whether it is a tank built of brick and stone, it is difficult to give a decisive and exact answer.

Our correspondents too often leave much to be inferred, or worse, imagined. If they would be more explicit they would be better satisfied with our replies and save us much useless labor and annoyance.

HOW LONG IS A YEAR?

There are a great many people who do not understand the philosophy of the leap year. Some even suppose that leap year was instituted by the goddess Venus only to confer upon ladies the privilege of popping the question, or that February has twenty-nine days that it might have a chance of the luck of odd numbers. Of course it is not necessary to bring any science to bear against such notions. The subject really involves certain important niceties, which we are persuaded not more than one in a thousand clearly comprehends, and for that reason we shall try to elucidate it.

Our civil year is founded upon the period of the revolution of the earth about the sun. We say founded upon, only, for the natural or astronomical year as determined by astronomers is not the same period of time as the civil year. If the natural year had exactly 365 or 366 days, there would be no trouble: the civil year would accord with it and represent precisely the same period of time. But the natural year cannot be divided into an exact number of days; and to complicate the matter still more, astronomers show us that there are several kinds of natural years in consequence of there being several distinct but legitimate ways of measuring the period of the earth's orbit.

We give two examples. Let the earth, the sun and a fixed star be in the same straight line at a given instant. Now the time which will elapse before they will be again in the same relative position is one kind of year. This year is called a sidereal year and its length is 365 d. 6 h. 9 m. 9·6 sec. But if the period be measured on the ecliptic, as for example the time which elapses between the sun's crossing one of the equinoctial points and again reaching the same we get a different result. This year is called the equinoctial, tropical or solar year, and its length is 365 d. 5 h. 48 m. 49·7 sec.

Now it has been agreed that this solar year shall be the foundation or standard of the civil year, and that the two shall be brought as nearly as possible into accord. In ancient times the subject was very poorly understood, and the civil year was constantly getting out of reckoning with the sun. The discrepancy evidently became a serious affair, when the natural winter encroached on the summer of the calendar.

Julius Cæsar, 46 B. C., made the first reasonable and substantial reform. He saw that the solar year was about 365¼ days long,—the figures were near enough to the truth to answer his purpose. If the civil year be 365 days, it is a quarter of a day short of the solar year; four civil years would have lost just a whole day. He therefore ordered that every fourth civil year should have 366 days. Thus originated the leap year. By his changes in the reckoning of time, Cæsar's name is made to live forever and to be on the lips of all men. The month July is named in his honor, and the Julian Calendar is still followed, over a considerable part of the earth.

If the solar year were exactly 365¼ days, there would never have arisen an occasion to reform the Julian Calendar. In fact, every Julian year gets in advance of the solar year about 10 minutes; in a century nearly a whole day. In Cæsar's time the vernal equinox fell on the 25th of March, in the sixteenth century it had fallen back to the 11th. The difference was getting to be important and the subject was ably discussed. The result was that Pope Gregory XIII., in 1577, approved and ordered a reform. The change actually took effect in 1582. In honor of the Council of Nice, ten days were dropped from the calendar, in order to bring the vernal equinox for all time on that day of the month, the 21st of March, at which it occurred in the year (325) of the meeting of the council. If there had been respect for the memory of Cæsar, fourteen days instead of ten would have been omitted.

To prevent a discrepancy in the future, between the solar and civil year, it was found that if only those centennial years of which the number after suppressing the two cyphers, is divisible by four, be regarded as leap years, the purpose is accomplished. The plan was adopted. In accordance with it 1900 will not be a leap year.

The protestant nations and those under the rule of the Greek Church, of course looked upon a reform instituted by a pope, with no favor. But protestant Germany and Denmark adopted it in 1700; England followed in 1752, and from that time forward "old style" and "new style" of necessity became household words wherever English was spoken. The Greek Church is however still unrelenting, and all those nations which are under its government still adhere to the Julian Calendar. The most conspicuous among these nations is Russia Julian reckoning is now twelve days later than Gregorian.

A SHATTERED THUNDERBOLT.

One of the most remarkable effects of lightning that we remember ever to have heard of, was experienced during a thunder shower that fell upon the crowds assembled at the Fair grounds at Springville, Erie Co., N. Y., June 27th. One of the exhibition sheds in which the spectators had taken refuge from the rain, was struck by lightning, and about a hundred persons were stunned and prostrated—invariably falling on their faces—some fifty remained insensible for five or ten minutes, a dozen were seriously burned, three or four were injured probably past recovery, but two horses, only, were killed outright. The escape of so many persons from instant death, while two horses alone were killed, seems miraculous: but a little attention to the circumstances may show that it was not unaccountable. It would seem that the force of the thunderbolt was divided into some hundred of nearly equal portions, probably in consequence of the crowd of persons standing erect, with their heads nearly approaching the roof of the shed, which acted as a distributor to that number of conductors. If, as may be presumed, the roof was at the moment sheeted with the pouring rain, the supposed distribution was greatly facilitated. The killing of the horses may probably be explained by the fact that one, at least, and probably both, were fastened by iron chain to the post or posts which afforded the most direct conductor to the current. The lightning struck a post in the center of the shed, against which Henry Tillou, the landlord of the West Falls Hotel, was leaning, and to which a horse was attached by a chain halter. The horse was killed instantly, while Mr. Tillou escaped by being dazed and knocked down. One woman was prostrated and deprived of her senses but not of her power of locomotion; she instinctively gathered herself up, and ran to the 'bus and was conveyed to Holmes' Hotel, and declared she had no knowledge of what took place after the flash until she found herself in a room at the house. Another woman was struck on the shoulder, the fluid passing down her side raising a blister in its course. A man from Otto was hit on the right side of the head, and on his recovery the mark was found to commence at the right eye, and could be plainly traced down the neck, across the chest and off the left arm.

BORING THROUGH THE HEART OF TREES.

In No. 25 Vol. XVI, was a communication relative to the boring of holes in diseased or non-productive trees and introducing sulphur, strongly condemning the practice and asserting that it is injurious if not fatal to the trees.

A correspondent, T. McG. of Ohio, gives the results of his observation and experience which differ somewhat from those of "F. R.," referred to above. He says: "A neighbor of mine has a cherry tree that is about nine or ten inches diameter, and every year the fruit either dropped off, or that which remained was so knotty and wormy as to be unfit to eat. Having seen a statement that boring through the heart and introducing roll brimstone would improve such trees, he tried it some three or four years ago, and whether from this cause or not, it is certain that the change was at once apparent. The tree put on quite another appearance, the leaves assumed a healthier color, and the yield ever since has been splendid in quality and large in quantity. After introducing the brimstone the hole was plugged up.

"Another neighbor bored a five-eighth hole completely through his trees, leaving the hole open, and they have since yielded excellent crops. The same neighbor, when a young man, was sent by his father to repair the back post of his cider press—one of the old-fashioned lever kind—and used for the post a worthless apple tree, which stood convenient and had been left only to preserve the uniformity of the orchard. He made a mortise through the tree of some 18 or 20 by 4 inches. From that time forward until the tree rotted down, by the moisture collecting around the tenon, which was a number of years, the tree bore excellently.

"These are facts, but I do not pretend to give the philosophy of them; if there is no connection between the boring and the subsequent improvement of the trees, the coincidence is at least remarkable."

TORPEDOS IN EVERY HOUSE.

Gunpowder in the open air burns quietly; in order to show that it has power we must confine it. Except for guns, firecrackers, &c., we might not have found out that gunpowder can make a great noise.

There is a common sort of friction-match composition that is a little more explosive than gunpowder. It burns quicker and when confined it gives a sharper and louder report. The matches to which we allude ignite with a flash and with a slight crackling sound; most of the matches, called parlor matches, are of this sort. The readiest way of making a match explode is to lay it on the floor and press it with the heel of your boot. The report in sharpness and loudness is about the same as that of a percussion cap. Another way of making the experiment is to wrap the match closely in stout paper and give the composition end a light blow with a hammer. The explosion will be as loud as before and the paper will be torn to shreds. There is without doubt enough explosive force in a box of matches to burst the stoutest musket. Children should never try the experiment of exploding matches. It is dangerous. The melancholy fate of the Austrian princess, betrothed to the son of Victor Emmanuel, and burned to death but the other day in consequence of treading on a lucifer match, is a warning in point. The greatest care should be taken of these too plentiful and perilous little articles.

THE PARIS EXHIBITION.

SMALL ARMS.

After Napoleon's wars came the long peace. Arms were almost forgotten. But after awhile there sprang up feelings of distrust, and every nation about the same period began to burnish its weapons, too late to check revolutions, but yet in time to re-establish dynasties. The rifle increased the power of infantry over the mob, and far-seeing Prussia made one step more, amid the careless criticism of her neighbors. The needle gun was perfectly well known in England and France, but an idea prevailed that nothing could be more dangerous than to store up cartridges which carried, beside powder, detonating composition. This was the true barrier raised up in the minds of soldiers against the needle gun; for its other defects, though apparent enough, need not be followed in new systems. It is a mistake to suppose that breech-loaders are new to England. About ten years ago Sharp's [American] carbine was introduced for cavalry service, and since then several others have been introduced and issued to different cavalry corps. The Westley Richards is about the best of these, and was all that could be desired, so long as cartridges carrying their own means of ignition were under a cloud. But if a rifle has to be capped half the value of breech-loading is unattained. Inventors were called forward to devise methods of adapting the Enfield rifle to modern requirements if by any means the task could be accomplished. The advertisement was issued in August, 1864. About fifty systems were proposed; five only were actually tried. Out of these Snider's was the only one with a self-igniting cartridge. Step by step it advanced till it made better targets than the old Enfield, and the Government Small Arm Factories were directed to throw their whole energies into the conversion, while the laboratory at Woolwich poured forth cartridges by hundreds of thousands.

The Snider method of conversion is undoubtedly simple and strong, the drill is far easier to learn than that of the old arm, and the whole alteration is effected at a cost considerably under 20 shillings. It may, therefore, be considered a success, especially as its ammunition, devised by Colonel Boxer, is strong, and so water proof that it can be laid under water for some hours without injury. Like most of the inventions of modern days the system is no novelty. A few weeks ago a lecture was delivered in London by Captain Majendie, R. A., who showed two weapons manufactured during the reign of Henry VIII., and wanting only some minor details to be veritable Sniders. The ammunition of the time was, however, very inferior to modern work, and it is upon this that the safety and good shooting of the arm depends. Here, as in all cases, the credit is due to those who work out a system, and after much labor arrive at a successful result.

But are all objections to breech-loaders disposed of when accurate shooting and safe ammunition have been attained? By no means. There are many people who still urge minor reasons for hanging back in the race, and point to the dangerous nature of the prize for which all the world are now striving. One great point with objectors has always been that men fire away their cartridges too quickly already, and will leave themselves without ammunition now that the possible rapidity of their fire is trebled or quadrupled. Nor is this question to be put aside without careful discussion. The campaigns in Denmark and Germany have shown that the Prussians fired away fewer rounds than the ordinary average; but, then, all the world are not Prussians. There is a danger, and the liveliest and most dashing nations are precisely those to whom this danger is greatest. France was one of the last to commence her rearmament, and her wisest soldiers would, even now if they could, put off the necessity. The brilliant and self-reliant Frenchman is too ready with his trigger, and just as the knight's charge, lance in rest, was rendered obsolete when fire-arms attained accuracy and facility, so does the present improvement in rapidity of fire place the advantage in the heads of cool, determined men rather than in the hands of dashing warriors, be their *elan* never so great. It is quite time that this should be well understood in England, for every report of practice with the Snider or the Chassepot is full of admiration of the rapidity with which the men fired, but says no word of means being taken to check that rapidity in ordinary work, leaving it to develop itself naturally on the spur of emergency. Is the English army generally aware that the Russians spend much time and trouble upon cooling the ardor of their soldiers, who are certainly not famous for dash at the warmest of moments? Do our infantry officers and non-commissioned officers walk behind their men when at drill, and touch on the shoulder first this one and then another, saying quietly "Now fire?" Is the spirit cultivated which led the inferior marksmen to hand their ammunition to their clearer sighted comrades before the intrenchments at Dybbol? If not, then we are in the wrong path, and the croakings of the slothful are in a fair way to be verified.

There is another great danger more likely to be risked in England than in France. It is the danger of training our troops to open fire at long ranges. A few sharpshooters may be usefully employed now and then for particular purposes, but the great secrets of modern success may be summed up in six words—shoot late, shoot straight, shoot strong. To shoot late requires coolness and training; to shoot straight demands absolutely that the range should be short. To shoot strongly the arm and ammunition must be adapted for the purpose. Here again steps in that useless, because impractical, longing for far ranges. A long and therefore heavy bullet (the bore being the same) will, of course, range further and with greater accuracy than a short one, but its initial velocity, and, therefore, hard hitting at short distances will be less with the same charge of powder. The French have chosen a light bullet and heavy charge, and they are right. The English bullet was lightened lately, and behold an outcry because it won't penetrate quite so many deal boards at 600 yards.

The advantages of breech-loaders are chiefly these—1, *Multiplication of fire*, so that for all contests, not actually hand to hand, the number of men are practically multiplied, say, threefold; but every loss of a soldier is in such a case equal to the loss of three; 2, *Facility of loading in all positions* and in all weathers; this enables the soldier to seek any cover,—a stone, a log, even a sod of earth behind which he can lie and maintain a steady fire, without exposing body or limbs. At close quarters, too, his bayonet need never be moved from the line with his enemy's breast, while he puts in the cartridge which will settle matters between them; 3, *Reduction of fatigue*; joined with No. 2 this improves the actual shooting; there are few rifles that are not more accurate than the average soldier who points them; 4, *Ease of repair and cleaning*; an oiled rag has only to be drawn through the barrel to clean it, and a damaged breech apparatus is readily replaced in all systems worth naming.

These advantages are now so palpable that it is not surprising to find all nations who exhibit at all showing breech-loaders. First among them all for beauty and adoption of the latest ideas stands France herself. Belgium stands next but not on account of her own inventors. She will make a Snider or a Chassepot, an American Remington or Peabody, and all of excellent workmanship, and at a moderate low price; but France is after all, the military nation, and, though to our eyes a plain well-made rifle looks more business-like, we have no reason to despise the love of arms which makes our neighbor lavish gold and silver and cunning workmanship upon the weapons they love.

If the visitor wishes to study the different systems most in vogue at present in Europe, he will find this Belgian Court by far the best to examine. England shows comparatively little, and that little, though generally good of its kind (Lang's case, for instance, and Whitworth's accurate and far-ranging rifle), strikes an inquirer at once as very high in price. Whitworth's little pea rifle costs £30. His double barrels, forged from one piece of metal, cost, with stock complete, £60, and though the Birmingham Small Arms Company sell single rifles with Whitworth barrels for £4 each, you can buy a double gun, with proof mark on it, for 15f. 75c. in the Belgian Court, a single one for 6f. 25.

Such weapons are not intended for real work; but if stock, lock, and barrels can be made at such prices at all, and really excellent double rifles for 400 francs (£16), whence arise these immense English prices which are daily driving English sportsmen to Liege and Prague for their guns? If Prussia designs to substitute a new weapon for her needle-gun she shows no signs of it at the Exhibition, and she is at this moment behind all other great Powers in her system, though she has enough of the awkward *zundnadel-gewehre* to arm all her troops with, and none of her neighbors can say as much. Russia is converting her arms on the Carl system, a modification of the gun that contributed so much to the success of Prussia in the late war. What her new system will be is uncertain. She has flirted with the Peabody rifle, but will probably wait, like ourselves, till she can satisfy herself better. Austria is hard at work changing her old weapons into breech-loaders upon Wänzl's plan, a sort of rough Albiny. While the Austrian Government exposes its cannons and torpedoes for free examination and discussion, the spirit of secret counsels seems to have fallen upon the private manufacturers, for though Wänzl shows his guns, they are wrapped around with wire, the inventor is absent from Paris, and no man may touch them. Enough is visible, however, to make the method perfectly clear.

It is a demonstrable fact that nations are open or close in their views as to information just in proportion to their preparations for war. Before the Danish campaign no government was more forbidden to strangers than the Prussian, because they were unready in many respects, and the value of the needle-gun was still unproved. Afterward they boasted of their powers, and made no secret of their military preparations. Austria continued silent because she was behindhand, and, though warned by her own commissioner sent to study foreign breech-loaders that the change must be made, was hesitating, and did at last hesitate too long to adopt any one system. France is now the closest of all, but she cannot hide her backward condition in many matters. A few days ago an English officer wished for explanations of certain pieces of artillery exhibited in the Exhibition of the French war department. He had been sent from England officially, and due application was made to the officer in charge. He replied courteously that he should have much pleasure, but dared not act without permission from the Minister of War. For what purpose, then, were the guns displayed at all? Pacific England is really best prepared in weapons, so she shows them freely, and wisely too. She is backward is some matters, and takes care to leave them in the shade.

The small arms in the Exhibition are so numerous and so wide in their range of system that I can do no more than draw attention to a few of the most interesting, and it is quite possible that some worth mentioning have escaped my notice, mixed up as they are with apparel and jewelry, and including guns for shooting every living thing, from whales to flies. This is no exaggeration. There are breech-loading pistols, shown by Gavelot, about an inch long, adapted for pin fire cartridges; capping pistols about the same size, and systems are the fowling-pieces shown by Barella in the Prussian department, but invented by Prince Pless. Their great feature consists in the absence of all hammers or anything that could destroy the smoothness of the exterior of the breech. They are well worth examination. Spencer's [American] rifle is known by name in England, and Russia tried it. The stock contains a copper tube holding seven cartridges, which could be pumped out rapidly if required, and a new tube with its supply introduced. But to guard against too reckless an expenditure of ammunition the gun can be used as an ordinary breech-loader for general purposes, the reservoir remaining in the stock to meet sudden emergencies. Then, there are methods, both French and English, for loading a gun at either breech or muzzle, if want of breech-loading cartridges should render the latter advisable. Another point worthy of remark is that pin fire seems to be dying out, and that central fire cartridges are more approved generally than those called rim fire. Revolvers are chiefly made to load from behind; indeed those issued for use in the French and Italian navies have long been arranged on this principle. Colt still adheres to the old plan, but it is said that a knowing American patented the "notion" of piercing the chamber through from end to end, even before any use was made of the invention. If simplicity and fewness of parts were alone to be considered, the Remington [American] must bear away the palm. The whole breech-closing apparatus consists of two pieces, which are very similar in shape, strong, and it would seem, easily made. The firing is rapid enough, too, but there is one objection to his system. The whole backward action of the discharge has to be borne by one of the pieces in the direction in which it opens and shuts. It thus acts upon the piece as upon a lever, the fulcrum of which is the hinge whereon is turns. The second piece supports its comrade, but its direction of movement is the same. One cannot but dread a gradual loosening of the apparatus, and a consequent escape of gas. The Chassepot has more parts than the Snider, and is less easily dismounted and repaired. They both have a weak point—spiral springs. The only spiral spring in the Snider of any importance might, however, be got rid of, as the French and other nations have shown. Lancaster's new breech-loader has, I believe, no spiral spring. But the Chassepot has a greater defect, and it is one which is generally spoken of. The close fitting of the breech depends in great measure upon an india-rubber buffer, and it needs not the opinion of foreign gunmakers to advise us of the dangers of such a system

There is a good weapon by Loron exhibited in the Belgian department. Only three motions are required before firing, and the parts are compactly put together. The Prussian needle-gun requires five operations in the hands of the most skilful, six in those of a less practised soldier. Mont Storm [American] has adapted his rifle to self-igniting cartridges, but Albiny's, adopted by the Belgian government, is, perhaps, the best on the general principle of hinging the breech-block in front, and turning it over upon the barrel before loading. It has a spiral spring like that of the Snider, but this could no doubt be expelled without loss to the system Boxer's cartridges are used for the Albiny gun, and are well thought of generally among foreign gunmakers. The Prussian and French government cartridges are of paper, and not waterproof. Most of the others are of copper or sheet brass. Boxer's are of thin sheet brass, rolled round a model, gaining a power of yielding slightly to the explosion of the powder, and thus obviating bursts. A peculiar base is also part of his system. All metal cartridges can be made waterproof, but the Chassepot and needle-gun will not admit of stiff cartridges. Spain has a few handsome guns, of no particular interest, and the curious weapons shown by all sorts of barbarians may be called weapons for fighting, but hardly weapons of war. There is one point, however, on which opinions in England differ. Is steel or wrought iron the best material for barrels? The strain on a small arm is so slight, and the manufacture of steel in bars so easy, that there is no danger as to strength; but the metal is apt to be damaged by the fire applied to it in various operations, especially brazing two barrels together for a double gun. If Whitworth has succeeded in overcoming this difficulty by making an accurate pair of barrels in one piece, he will have earned the gratitude of gunmakers, unless his prices are too high. Two firearms yet remain to be named, Devisme's, who shows a sort of improved Chassepot, which has some practical advantages, and explosive bullets for shooting lions, elephants, and even whales, according to the gun from which they are fired, and Le Baron's system of igniting the cartridge by electricity. The stock is hollow, and contains a whole apparatus of galvanic battery, accumulating coil, and wires. The cartridge has two small wires with a little space between their points. When it is introduced and pressed home, one end of the conducting wire touches the center of its base, and so communicates with one of the wires contained in it. The other end of the conducting wire is brought into contact with the second cartridge wire by touching a spring—the trigger, in fact. A tiny spark leaps over the interval from point to point, and fires the cartridge. If M. Le Baron could simplify and diminish his apparatus, it might supersede all hammers, anvils, and caps, but at present it weakens the stock too much.—*London Times.*

A HEAVY TRAIN.—Probably the heaviest train that ever run on any road recently passed over the Lehigh Valley Railway. It consisted of two hundred and seventy-five loaded cars, each, including couplings, being fourteen feet in length, making a total extension of 3,850 feet, or over two thirds of a mile. Allowing six tuns as the average weight per car, the total weight amounted to 1,650 tuns.

A GIGANTIC ENGINEERING PROJECT is now the sensation out West, which contemplates nothing less than tunneling the Atlantic for a railway. The plans are already supposed to be drawn up, complete in detail, even to lighting the cars with the magnesium and electric lights. The undertaking is to employ one hundred thousand men for thirty years, and when completed it will take the trains but five days to complete the journey from New Foundland to Ireland, *via* the telegraph route. The amount of capital required to carry out this project is estimated at two billion five hundred million dollars

Leather Splitting.

In the commerce of leather in France, we apply the word crust to that part of the leather which is nearest the flesh, and which is separated from the other portion of the skin bearing the hair. The strength for resistance in a tightly stretched skin is entirely in the portion nearest the flesh, the fiber, as we approach the upper or grain side, gradually becoming looser, and the force to resist stretching, gradually diminishing in such a manner that it is always here that the breaks or cracks in leather begin to manifest themselves, with the slightest increase of the usual strain.

If then, the grain of such leather be removed, the force of resistance and the expansion of the balance will be much more even, and the whole will be better balanced, as it were; the grain will no longer be present to mark by cracks and fissures where the excess of strain began to operate.

Before the genius of inventors was directed to the invention and perfection of leather-splitting machines, leathers were used in their entire thickness, and if only a moderate thickness was required, they obtained it by shaving off as much as they found necessary from the flesh side of the hide; now, for the purpose of preserving its strength and making its capacity for extension even and regular, this was the very contrary of what should have been done.

Since the employment of machines for splitting, the manufacturer is able to employ the grain for the purposes to which it is best adapted, and to make the crust, or flesh side, serviceable to the best advantage, notwithstanding that the latter was in discredit for some time. We well recollect the repugnance with which the general public beheld anything made of the crust of shaved or split leather. People then thought that all parts would crumble into pieces in the hand when the grain was taken off. Since it has entered into consumption it has come to be a great necessity, and is largely used to manufacture saddlery and trim carriages, in trunk making, in forming the tops of sabots and galashes, and when waxed and varnished, etc., in inferior grades of shoes, shoe tips, etc.

The hose and the leather piping we exhibit, are made of the split crust of the leather, as above mentioned; their quality is no less a recommendation than their reasonable price. Tubing and hose made of the entire leather with the grain on, become slacker and tighter by the influence of water, or the weather. With those made of split leather the case is different; the effect of shrinking and expanding is produced in the first wetting they get, and they never again change their form, but remain rigid, notwithstanding all the changes that may take place in the temperature. The grained leather then is easily altered by atmospheric and other influences; the crust, on the contrary, remains firm and not liable to moisture.—*Picot & Co., in La Halle aux Cuirs.*

Caramel Colors.

Sugar is the only fit material to prepare caramel; and for this purpose the sugar is best heated in capacious roomy vessels made of copper (in Vienna, copper lined with silver, is preferred), the vessel containing a thermometer to indicate the temperature. The latter must not be below 410° nor above 428° Fah. The heating of the sugar is continued so long as aqueous vapors are given off. The crude caramel so obtained is best purified by being placed upon a parchment paper dialyser, which is placed on water. The undecomposed sugar and intermediate compounds are thus got rid of; they dissolve out with facility, and what remains on the filter is, weight for weight, five times as strong in coloring matter as the crude caramel. While the sugar is being exposed to heat, it is preferable to stir it with a spatula.

Another mode of obtaining a pure caramel, free from bitter produce (assamar and the like) is to heat the sugar as above, and to treat the powdered caramel with alcohol (pure methylated spirits) to digest it for three or four hours therewith, and repeat this until all bitter taste is gone. An aqueous solution containing 10 per cent of purified caramel, is gummy and forms a jelly. When a solution of caramal in water is evaporated *in vacuo* (small vacuum pans as used in sugar refineries), it dries up to a black, shining mass, freely soluble again in water, hot or cold; but if the solution is evaporated on a water bath to dryness in contact with air, the whole mass becomes insoluble in water, either hot or cold.—*Chemical News.*

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 2, 1867.

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.

66,203.—LAMP BURNER.—Philander Baker, Chicago, Ill.

1st, I claim the combination and arrangement of the disk, e, and safety plate or diaphragm, b, t-en connected at their perimeters by a spiral coil or its equivalent, as described, with the two sections of the wick tube, arranged as specified with respect to each other, and the cone, I, arranged and operating as and for the purposes set forth.

2d, I claim, in combination with the elastic arms, l, the arrangement of the spring hoop, k, constructed and applied so as to operate in the manner and for the purposes specified.

66,204.—VALVE GEAR FOR STEAM ENGINES.—Louis D. Bartlett, Fitchburg, Mass., assignor to Putnam Machine Company.

I claim operating the valve of a steam engine by means of the lever, D, actuated by the eccentric cam, E, in combination with the lever, B, substantially as described.

I also claim, in combination with the above, the supplementary cam or toe, G, operating substantially as described for the purpose set forth.

66,205.—CORN SHELLER.—George Bevitt (assignor to himself and John George Ott), Madison, Wis.

1st, I claim the cylinder, B, provided with the oblong inclined teeth, D, constructed substantially as described.

2d, in combination with the cylinder, I claim the concave slats, E, when arranged to operate in connection therewith, substantially as described.

3d, Providing the concaves, E, with the spring, F, as and for the purpose set forth.

66,206.—DRYING BRICKS.—Joseph R. Bowers, Concord, N.H.

I claim the application of artificial heat by means of steam or hot-air pipes, when such pipes pass beneath the surface of the drying ground, and are constructed as described for the purpose of drying bricks.

66,207.—CIDER MILL.—E. W. Branch, East Henrietta, N. Y.

I claim the combination and arrangement of the spring board, K, and adjustable bed, I, with the grinding apparatus, consisting of the disk, E, fitting in the rim, h, of the wheel, C, which is driven by jointed pawl, D, the whole constructed as described and operating in the manner and for the purpose set forth.

66,208.—PROCESS OF PRESERVING FRUITS AND OTHER PERISHABLE ARTICLES.—William D. Brooks, Baltimore, Md.

I claim filling cans or other vessels, containing fresh fruits or other perishable articles, with hot sirup or other fluids by means of a supply tube, delivering the same under pressure at or near the bottom of the can, substantially in the manner and for the purpose herein set forth.

I claim also the use of steam in the process of preserving fruits and other perishable articles, when delivered into the vessels containing the same, substantially in the manner and for the purpose set forth.

I claim also the combination of a steam or hot-air space, D, with a reservoir C, to encircle the same and maintain its contents in a heated state, when said supply pipe is arranged to operate substantially in the manner and for the purpose herein set forth.

66,209.—HEDGE FASTENER.—C. D. Brown, Tampico, Ill.

I claim the method herein described of holding down young plants for the purpose of producing strong and thickly set hedges.

66,210.—DEVICE FOR BENDING DOWN PLANTS TO FORM HEDGES.—C. D. Brown, Tampico, Ill.

I claim the use of a tapering trough constructed substantially as described for the purpose of bending down hedges.

66,211.—APPARATUS FOR GATHERING APPLE SEEDS.—Russell Brusie, Cleveland, Ohio.

I claim the construction of a box, A, provided with the gates, B H and E, in combination with the blades, L, substantially as and for the purpose described.

66,212.—BOTTLE CAPS OR TOPS.—W. Burnet, N. Y. City.

I claim a bottle cap made of rubber or other suitable material, provided with one or more closed tubes, all made and operating substantially as described, or their mechanical equivalents.

66,213.—TOPS FOR MUCILAGE AND VARNISH BOTTLES.—W. Burnet, New York City.

1st, I claim an elastic cover for gum and varnish bottles, so shaped that it will at the same time cover the mouth of the bottle, furnish a spring to allow endwise motion to the brush, and return it to its normal position, and clasp the handle of the brush so that it may be moved up and down in the cap, and held at any desirable hight.

2d, I claim the combination of the above top, made of any suitable elastic material, with a brush for varnish and mucilage bottles, all made and operating substantially as described, or their equivalents.

66,214.—SHIFTING BUCKET PROPELLER.—Jacob Busser, Philadelphia, Pa.

I claim, in combination with the pairs of hinged buckets, the shifting bar and slides, so that by means of a lever the propulsion may be forward or backward without stopping or reversing the engine or changing the direction of motion of the crank shaft, substantially as described.

66,215.—INSULATOR HOLDER.—Richard Calrow, Mamaroneck, N. Y. Antedated June 22, 1867.

I claim the combination of the block, g, metallic covering, c, and the holder A, for the purposes set forth.

66,216.—CLAP-BOARD GAGE.—A. Carson, Memphis, Tenn.

I claim a clapboard gage, composed of the graduated plate, A, jointed and sliding arm, F, having projections, G and H, with point, J, and adjusted upon and held to plate, A, by means of the thumb screw, D, when all the parts are constructed to operate substantially as described and for the purpose set forth.

66,217.—MITER BOX.—E. C. Cheek, Placerville, Cal.

1st, I claim an adjustable miter box, composed of a bed or frame, A, to which are secured the swinging arm, B, the permanent stops, H H, and the movable stop, I, all constructed and operating substantially as described and for the purpose set forth.

2d, The movable stop, I, to hold the work close to the saw cut, and on either side of the same, and operating substantially as set forth.

66,218.—MANUFACTURE OF SOAP.—John Chilcott, Brooklyn, N. Y. Antedated June 15, 1867.

I claim the manufacture of soap from gelatine, either with or without grease, oil, or fatty matter, by first subjecting the gelatine to the action of a suitable degree of heat to render it saponinable, and afterwards treating it with alkali, substantially as herein specified.

66,219.—CHURN.—Norman B. Clabaugh, Frederick, Md.

I claim the construction of a rotary churn dash of longitudinal parallel bars or wings, C C h, applied to heads, D D', and provided with pins, p p, applied substantially as and for the purposes described.

66,220.—SINK.—Hugh H. Craigie, New York City.

1st, I claim a trap for sinks, formed by the detachable cup, d, attached to the under side of the sink, in combination with the downward projecting ferrule or pipe, b, as and for the purposes set forth.

2d, I claim the bend, f, and trap, d, in combination with the soft metal pipe, g, connected to the bend, f, by the ring, h, and neck, substantially as and for the purposes set forth.

66,221.—BRIDLE BIT.—John M. Crawford, Philadelphia, Pa.

1st, I claim the slotted cheek pieces, B B', either curved or straight, when attached to a bridle bit, substantially as and for the purposes set forth.

2d, Making the cheek pieces capable of being reversed, by acting in combination with bit, A, and screws, C, substantially as and for the purposes set forth.

3d, The combination and operation of the bit A, screws C, and cheek pieces B, with the cheek strap, F, and reins, D and E, substantially as and for the purposes set forth.

66,222.—POWER HAMMER.—Albert Cunningham and Alonzo Sharp, Salem, Ohio.

1st, We claim the links, R S, lever, R', and slotted segment, Q, as arranged in combination with the lug, H, for the purpose and in the manner as set forth.

2d, The adjustable collar, L O, springs, M N, in combination with the rod, K, and adjustable lug, H, as and for the purpose herein described.

66,223.—BOILER FEEDER.—Jeremiah Darling, Cincinnati, O.

1st, I claim the construction of the mouth, B, of the pipe, C, when connected with and operating in a steam boiler, as herein described and for the purpose set forth.

2d, I also claim the arrangement of the rotating exhauster, R, with its ducts S and T, when operated around the pipe, P, in the tank, L, as herein described and for the purposes set forth.

3d, I also claim the arrangement and combination of the steam whistle, K, with its reservoir, J, and steam and water cells, I and F, as herein described and for the purposes set forth.

4th, I also claim the arrangement of the pipe, C, with the boiler, A, and cells, I and F, with the whistle, K, as connected by pipe, U, and cell, L, with the exhauster, R, all when combined and operating as herein described and for the purposes set forth.

66,224.—WASHING MACHINE.—Samuel Davis, Kansas, Mo.

I claim the combination as well as the arrangement of the annular suction ring or board, O, with the perforated or grated plunger, B, and the application of the plunger to its working lever, C, by means of a swivel connection in order to enable the plunger to revolve while in use, the whole being substantially as described.

66,225.—HYDRANT.—W. P. Dickinson, D. S. Witman, and G. W. Rabold, Reading, Pa.

1st, We claim valve, M, in combination with its lubricator recesses and holes, discharge hole, m, constructed and arranged in the manner and for the purpose above described.

2d, The combination of valve, M, lubricator recesses and holes, f f f, valve rod, K, and key rod, R, globe case, A, and goose neck D, constructed, arranged and operating together in the manner and for the purpose above described and set forth.

3d, The key rod, R, combined with valve rod, K, by means of a cogged lever and five-teeth pinion, as above described and for the purpose set forth.

69,226.—STOVE FOR CARPENTERS' USE.—H. Dietz, N.Y. City.

I claim the construction of a carpenter's stove by the combination of angle irons and sheet iron together with fire-brick or soap-stone bottom lining, in the manner and for the purpose substantially as described.

66,227.—PRESSER GAGE FOR GAS FITTERS.—R. B. Donaldson, Washington, D. C.

I claim a gas fitter's pressure gage, constructed by combining the base, A, containing the reservoir, b, elastic bottom, c, and socket, a, with the shank, of the tube, B, in the manner and for the purpose described.

66,228.—CAR SEAT.—A. S. Dotter, Philadelphia, Pa.

I claim one or more leaves or plates attached to arms of a car seat, so as to be either folded and depressed or elevated and secured in a horizontal position, all substantially as and for the purpose described.

66,229.—DRILLING APPARATUS.—John Fanning, N. Y. City.

I claim a drilling apparatus constructed as described and shown.

66,230.—WATER INDICATOR FOR BOILERS.—Ambrose G. Fell, Brooklyn, N. Y., assignor to himself and Wm. Bell, New York City.

I claim the construction of a water indicator for steam generators having one or more sides of mica, substantially as and for the purpose herein set forth and described.

66,231.—APPARATUS FOR FORMING SKELPS FOR SHEET METAL TUBES.—Robert Feller, Taunton, Mass., assignor to himself and the Dighton Furnace Company, Dighton, Mass.

What I claim is the above described improved apparatus for forming sheet metal tubes.

66,232.—MACHINE FOR SKEINING SILK, THREAD, ETC.—Cyrus Fisher, Canton, Mass.

I claim the combination and arrangement of the thumb rest, r2, with the next adjacent rotary hook and its puppet.

I also claim the arrangement of the driving shaft, K, of the flyer with respect to the flyer shaft, and to the driving gear of the next adjacent rotary hook.

I also claim the combination as well as the arrangement of the skein case, F, with the flyer and the rotary hooks and mechanism for revolving them, as described.

66,233.—WATER-CLOSET VALVE APPARATUS.—James Gillilan, Charlestown, Mass.

I claim the combination of the elastic metallic concavo-convex cap, D, with the flexible cup-shaped piston, d, applied to the valve stem, B, and arranged within the vacuum chamber, C, as and for the purpose specified.

I also claim the arrangement of the spring, E, within the vacuum chamber, and with respect to the piston, as set forth.

66,234.—CAPPING PAD SCREWS.—C. F. Grilley, New Haven, Conn., assignor to the Grilley Company.

I claim the method of drilling or perforating the screw head and cap blank, after the two have been united together, and at one operation, substantially as herein specified.

66,235.—CHURN.—O. Hawley and J. W. Ward, Wheeling, West Va.

We claim the agitators, F F F F, also the combination of the springs, D, stops, E, and balls, C, operating in the manner and for the purpose described.

66,236.—SEED PLANTER.—George E. Herrick, Lynn, Mass.

I claim the combination and arrangement of the two perforated disks, and their clamps, with the hopper, and the agitator of the said planting machine, the whole being substantially as described.

66,237.—FRUIT JAR.—Edward D. Holman, Buffalo, N. Y.

I claim the combination of the spring, A, with the conical cap, B, and rib, D, when constructed substantially as and for the purposes described.

66,238.—NUT MACHINE.—David Howell, Louisville, Ky.

In the described combination with the die, H, and punches, F G and O, I claim adjustable guide blocks, J and M, for the purposes explained.

66,239.—DEPTH GAGE.—Ivory A. Hurd, Boston, Mass.

I claim the combination as well as the arrangement of the wing piece, B B, with the spindle, A, check nut, E, and collet, D.

66,240.—COMBINED PLOW, HARROW, CULTIVATOR, AND ROLLER.—James Johnston, Pemberton, Ohio.

I claim the rollers, D, and trucks, E, or either of them, and the harrow frame, C, adapted to receive harrow teeth, shovels, or cultivators, and to be lifted by the levers, c, in combination with the axle and the adjusting washers, e, the whole arranged and operating substantially as set forth.

66,241.—MACHINE FOR DRAINING SUGAR.—Cassius Macumber, Aurora, Ill.

I claim, 1st, Constructing the revolving separator of a series of draft chambers by means of the inclined partitions, substantially as described.

2d, The arrangement and combination of the revolving and fixed disks, T T2, and cone, T5, for the purpose and in the manner substantially as described.

3d, Placing the beaters obliquely on the revolving disk for the purpose described.

66,242.—RAILWAY CHAIR.—John Mohn, Detroit, Mich.

I claim, 1st, a railway chair, which is constructed with a solid portion, a a, slotted base, j, an elevated table, K, and an abutting lip, a', adapted for receiving the notched rail sections, A A, a supporting and covering plate, c c', and a key, f, substantially as described.

2d, The mode herein described of securing the chair by means of the spikes, f f, for the purpose set forth.

66,243.—CONDENSER FOR STILLS.—Clarence Morfit, Baltimore, Md.

I claim a condenser which is adapted for use in conjunction with a still, and which is divided into a number of chambers, communicating with each other, and provided with two series of pipes or conduits, so arranged as to admit of the separation and revaporization of the distillates and their return to the still, substantially as described.

66,244.—BAND COUPLING.—Stephen Moulton, Hartford, Ct.

I claim, 1st, A ball and socket joint, having an aperture in the side of the socket for hooking in the ball, substantially as herein described.

2d, The application of a ball and socket joint of the form and construction herein described, to the purpose of coupling of a band or cord, substantially as herein set forth.

66,245.—REVOLVING HARROW AND CULTIVATOR.—Amos Newell, New York City.

I claim the combination and arrangement of the spiked harrow, substantially in the manner and for the purposes described.

66,246.—RAILWAY RAIL COUPLING.—Joseph Newham, Kent, Ohio.

1st, I claim the combination of the bar block and washer, with the ends of the rails and spike, substantially as and for the purpose set forth.

2d, Securing the ends of railroad rails in position, substantially as and for the purpose set forth.

66,247.—MACHINE FOR SHAVING HORN.—William Noyes, Jr., Newburyport, Mass.

I claim a machine or combination consisting of a bed plate, A, two cutters, c c, two guide-plates, a a, and two feeders, B C, such feeders being provided with springs, g g, and operative mechanism, substantially as described.

I also claim the combination of the bed plate, A, cutters, c c, d d, guide plates, a a, and the feeders, B C, such feeders having springs, g g g, arranged to operate with the bed plate guides and knives, substantially as specified.

I also claim the feeding mechanism or combination composed of the two feeders, B C, the cams, l k, eccentrics, o o, and connecting rods, p p, arranged to operate as specified, such feeders having springs, g g, as explained.

I also claim the combination of the cooling tank or trough, F, with the machine composed as described, of the bed plate, A, its cutters, c c, guide plates, a a, and the feeders, B C, having springs, g g, and being provided with mechanism as explained, for advancing and retracting such feeders.

I also claim the construction of the receiving end of the bed plate, viz., as oblique to the edges of the plate as set forth.

66,248.—DRAW PLATE.—J. O'Kane, New York City, assignor to Edward H. Hotchkiss, Brooklyn, N. Y. Antedated June 20, 1867.

I claim the construction of a draw plate, with a communicating slit, r, arranged with reference to each hole, substantially as and for the purpose herein specified.

66,249.—WINDOW WASHER.—Nat Palmer, Newcastle, Me.

I claim the combination of a hollow staff or tube, with the bulb and tubing of a rubber syringe, a sponge or mop, and metal tube, in manner aforesaid.

66,250.—EXPANDING REAMER.—William F. Patterson, Charlestown, Mass.

I claim the combination of the shell, A, piston, B, cutters, C, and springs, D, all constructed and arranged substantially as and for the purpose set forth.

66,251.—HOISTING MACHINE FOR VESSELS.—Horatio O. Perry, Buffalo, N. Y.

I claim forming a line of shafting in sections, A D, connected by variable and extensile couplings, B C, for use on shipboard, constructed arranged and operating substantially as set forth.

I also claim, in combination therewith, the friction pulley, E, wheel, F, lever, J, and brake, K, arranged and operating substantially as set forth.

66,252.—POTATO DIGGER.—Charles H. Pickering, Indianapolis, Ind. Antedated June 27, 1867.

1st, I claim the double-shared plow, G, with the slats, g, and side boards, as shown, in combination with rotary gatherer, H, substantially as and for the purpose set forth.

2d, The scraper plow, F, in combination with the double shared plow, G, substantially as and for the purpose set forth.

3d, The arrangement of the levers, D, for supporting and operating the wheels, B, substantially as and for the purpose set forth.

4th, The slotted inclined plane, O, for conveying the potatoes to the box, L, in combination with the rotating carrier, H, substantially as and for the purpose set forth.

66,253.—CORN PLOW.—Mathias Redlinger, Freeport, Ill.

I claim the arrangement of the lever, A, with its roller, E connected to beams, G, and the treadle, C, as arranged with the plows, B, when combined with the beams, G, as herein described, and for the purposes set forth.

66,254.—MACHINE FOR BUNDLING KINDLING WOOD.—John Richardson and Frederick H. Stevens, New York City.

1st, We claim the use of a tube having its end provided with a sharp edge, and having its interior slightly conical, for the purpose of receiving, shaping, and holding the bundle, substantially as described.

2d, The combination of the driving wheel, E, mounted on the tubular shaft, F, with the arm, H, secured to the shaft, G, and the lever, d, or its equivalent, arranged to trip the dog, c, and to be operated by the wood carrier, as the latter brings the wood to the bundling tube, B, substantially as set forth.

3d, The wire clasping and twisting device, consisting of the mandrel, M, and the slid ng rod, k, provided with the lip, l, or its equivalent, when arranged to operate as and for the purpose set forth.

4th, Regulating the twisting of the wire, and the shifting of the clutch by means of the disk, R', operated by the mandrel, and returned by the spring, l, substantially as described.

5th, The combination of the mandrel, M, level gear, O1 O2, sliding clutch, P, excentric, u, and arm, P', arranged to operate as and for the purpose set forth.

6th, The combination of arm, P', elbow lever, Q, and disk, R, arranged to be operated by cam, R3, or its evuivalent, in connection with the movement of shaft, G, for the purpose of moving the clutch, P, at the desired time, substantially as described.

7th, The tube, B, having its end arranged to operate in connection with the edge or lip of the recess in the end of the mandrel through which the wire is fed for cutting off the wire by a shear cut, as set forth.

8th, The wood carrier, consisting of the sliding box, C2, mounted on the reciprocating plate, C3, when arranged to operate substantially as described.

66,255.—MACHINE FOR HUSKING CORN.—Daniel Sager, New York City.

1st, I claim the arrangement of the picker, C, shaker, E, endless apron, F, husking rollers, G G, and adjustable blades, M M, essentially as described, for the purpose set forth.

2d, The shaker, E, for delivering and directing the course of the ears, by motion communicated through the eccentric, L, or its equivalent, in the manner substantially as specified.

3d, The endless apron, F, arranged in relation to the husking rollers, G G, so as to carry the ears of corn thereto, and rotate them, whilst husking, and afterward to discharge them from the machine, essentially as described.

4th, The husking rollers, G G, supported in bearings, O O, having elastic supports, P P, substantially as and for the purpose set forth.

5th, The adjustable blades, M M, essentially as and for the purpose specified.

66,256.—DRY GAS METER.—John Schatt, assignor to himself and Samuel P. Mervine, Jr., Philadelphia, Pa.

I claim attaching the leather, B, and the ring, A, together, by means of the single cord, C, and the groove, a,'' closed tightly over the said cord and leather, substantially in the manner described and for the purpose specified.

66,257.—PAINT COMPOUND.—Mortiz Schneider, Cleveland, O.

I claim a paint composed of the ingredients herein named, and compounded in the manner substantially as herein set forth.

66,258.—MACHINE FOR DRESSING PAPER PULP.—George E. Sellers, Seller's Landing, Ills.

1st, I claim the annular chamber, B B, through which the pulp is delivered into the chamber, C. The chamber, C, and agitator, Q, to collect the heavy

particles into the center, over the receiver, D, substantially as described, and for the purposes specified.

2d, I also c aim the pulp screen, F, with the slit or slits, a a, the agitator or float, Q, to give direction to the pulp in the line of the slits, the pulp receiver, J J, and regulating valve, L, and the knot receiver, M M, all substantially as des ribed, and for the purposes specified.

66,259.—PLOW.—James B. Skinner, Rockford, Ills.

1st, I claim adjusting the coulter, both vertically and lat: rally, substantially in the manner described.

2d, The combination of the coulter spindle, with the bracket plate, and socket, as shown in fig. 1.

3d, The combination of the coulter spindle, with the double bracket plates and stop pin, as shown in fig. 2.

4th, The combination of the laterally adjustable bracket plate, spindle socket, and diagonal champ, as shown in fig. 3.

5th, The combination of the spindle, laterally adjustable bracket plates and clamp bolts, as shown in fig. 4.

6th, The combination with the caster spindle, of a series of locking washers, as shown in fig. 5, for the purpose described.

66,260.—PLOW.—James B. Skinner, Rockford, Ills.

1st, I claim the combination of the caster yoke, with the horizontal caster spindle, as shown in fig. 1.

2d, The combination of the caster yoke, with the horizontal caster spindle, by pivoting the yoke on a vertical pin in the loop on the spindle, as shown in fig. 2, for the purpose of preventing wabling of the coulter, and yet leave it free to vibrate lat: rally.

3d, The combination of the caster yoke, with the squared thimble turning on the fixed spindle projecting from the bracket plate, as shown in fig. 3.

4th, The combination substantially as described, with the horizontal caster spindle, o, of the double half round boxes, p, suspended in the loops, pl, and a cross bar, P, for the purposes set forth.

66,261.—SPLICING BELTING.—N. E. Smith, East Cleveland, O.

I claim the herein-described method of splicing belts, in the manner substantially as specified.

66,262.—CIDER PRESS.—A. D. Strong, Ashtabula, Ohio.

I claim the screws, K, and ratchet wheels, I, supported in the cross pieces, B G, of the frame, A, and operated by means of the levers, M, pawls, L, and

66,263.—EXTENSION UMBRELLA.—William H. Sutherland, Seven Mile, Ohio.

1st, I claim the combination and arrangement of the extension stick, and extension ribs, substantially as shown and described.

2d, I claim the tongues, z z, the grooves, j j, the bands, l l, the pins, t t, the notches, s s, and collars, u u, as seen in figs. 4 and 5, by which the sections of the stick are made to glide equally, and locked and unlocked and kept in position, all substantially as shown and described.

3d, I claim the handle, b c c, with all its parts, as seen in figs. 4 and 8, as described.

4th, I claim the tablet, k, with its pin, m, and ledge, p, in fig. 6, the ferrule, q, with its slots, o o, adapted to move around the runner, h h, as seen in same fig., and already described.

5th, I claim the slot, ol, with its beveled edges, r r, in runner, h, in fig. 7.

6th, I claim clasps, 3 4 and 5, as combined and arranged of sections, A B and D, as seen in figs. 3 and 9, the tip, c, the shoulders, 8, and the center punch, 6, with the cavity, 7, for the reception of center punch, 6.

7th, I claim the wings, 15 15, of clasps, 4, adapted for attaching cover, as seen in fig. 9.

8th, And I also claim, in combination with an umbrella stick, the sliding sections, A B and D, substantially as described, by which the rib is shut up or distended.

66,264.—METHOD OF PROPELLING VEHICLES.—Abijah Taylor, Indianapolis, Ind.

I claim propelling mechanism consisting of an endless chain or chains, bands or ropes, E, way or rails, A A1, anti-friction pulleys, I I, and legs, G, with feet, the said legs being carried by the chains, bands, or ropes, and the whole being arranged and operating substantially as and for the purpose set forth.

66,265.—MACHINE FOR ROLLING STENCH-TRAP PIPE.—H. H. Taylor, and J. H. Wilson, Rochester, N. Y.

We claim the method herein described, of forming stench-trap pipes, by the employment of the rollers, A B B1, operating in such a manner as to swage the sides and edges of the pipe, unequally, so as to produce the necessary bends as herein set forth.

66,266.—THERMOMETER.—Lewis C. Tower, Rochester, N. Y.

1st, I claim a thermometer whose frame is made from a single piece of sheet metal, corrugated as described, to give it stiffness, and provided with a groove and socket to receive the tube and bulb, substantially as herein set forth.

2d, The combination of the sliding shield, d, with the frame, A, and bulb, a, as and for the purpose specified.

66,267.—SHOVEL PLOW.—Rufus Trowbridge, Waterloo, Iowa.

I claim the combination of a flat glass plate, to the face of the share of shovel plows, substantially as specified.

66,268.—PACKAGE FOR HOLDING AND SHIPPING LARD.—Charles L. Tucker, Chicago, Ills.

1st, I claim the box herein described, when constructed without a lid or

2d, The application of gum arabic, or its equivalent, to small lard packages, either to wood or paper, for the purpose of making them non-absorbing, substantially as specified.

3d, 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.

4th, The mode herein described of packing lard for transportation, 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 and for the purposes specified.

66,269.—COUNTING MACHINE.—U. Turner, Versailles, Ky.

1st, I claim the wheel, B, with its spring coil, C, and dial, D, in combination with the feed-finger, E, and detent, G, substantially as and for the purpose described.

2d, The feed-finger, E, spring, F, detent, G, wheel, B, and coil, C, for reversing the dial, D, and resetting it at zero, and without changing the position of the instrument, or of the hand that holds it, substantially as herein shown and described.

66,270.—BOTTLE STOPPER.—Theo. A. Weber, New York City.

1st, The combination of the cap, a, and elastic diaphragm, b, the latter being perforated and applied to said cap, substantially as and for the purposes described.

2d, The combination of a perforated cap, a a, perforated diaphragm, b, and a ring, c, when adapted for being held down tight upon a bottle, substantially as described.

3d, The cap, a, diaphragm, b, with or without ring, c, stirrup, b, an eccentric, m, all combined and adapted to serve the purpose explained.

66,271.—SAW MILL.—Carlyle Whipple, Detroit, Mich.

I claim the curved guides, F and G, when the curvature of the upper is the reverse of the lower, arranged in relation to the saw, and operating substantially as and for the purpose specified.

66,272.—FLY AND MOSQUITO BAR FOR WINDOWS.—F. D. Wright, Jordan, N. Y.

I claim the combination with the sash of a window, of the automatic fly and mosquito bar, made up of the screen, D, roller, C, and cord, E, arranged and operating in the manner and for the purpose herein set forth.

66,273.—SPRING CLASP.—A. C. Wurzbach and William Wurzbach, Memphis, Tenn. Antedated June 22, 1867.

We claim an adjustable clasp, when constructed and operated, substantially as herein described.

66,274.—MANUFACTURE OF GLASS.—Theodor A. Zellers, East Birmingham, Pa.

1st, I claim treating glass cylinders in a flattening oven, and reducing them to flat sheets, by the heat evolved from the combustion of hydrocarbon oils, or their products or compounds, substantially in the manner and for the purposes hereinbefore set forth.

2d, In connection with an oven for flattening glass, the car, b, and turn table, c, or a raised vibratory platform in lieu thereof, for the purpose of so

66,275.—WASHING MACHINE.—O. W. Alger, Richmond, Vt.

I claim the arrangement of the box, A, with ribs and perforations, and the ribbed and hinged lid operating substantially as described.

66,276.—HANGING AND VENTILATING WINDOW SASH.—Chas. Allen, Petersburg, Ill.

I claim the tightener, b b', when applied to the cord, a, of the sashes, A B, substantially as described and set forth.

I also claim the ventilating p ece, C', applied to the frame, C, in combination with the self-balancing sashes, A B, and cord tightener, b b', substantially in the manner and for the purpose set forth.

66,277.—MACHINE FOR PREPARING PEAT FOR FUEL.—John H. Ames, New York City.

1st, I claim the revolving separator, c, in combination with the hopper a, conveying b it, b, and receptacle, d, for the purposes and as specified.

2d, I claim the compressing and mixing rollers, h h', to one of which an end motion is given, in combination with a hopper, g, to which heated air is admitted for the purposes and as set forth.

3d, I claim drying peat by means of heated air, within a chamber in which the peat descends in thin sheets, strips, or pieces, substantially as set forth.

4th, I claim the charger, o, separating the hot air and exhaust chambers, and delivering the peat into the latter as set forth.

5th, I claim the chamber, p, and plunger p', in combination with the revolving press block, 16, and an exhausting apparatus substantially as set forth, for producing a partial vacuum in the chamber containing said peat, before said peat is pressed, for the purposes and as set forth.

6th, I claim a revolving press block with tapering openings for receiving the peat and holding the cake after being pressed, as and for the purposes set forth.

66,278.—LAMP.—Joseph K. Andrews, Antrim, Ohio, assignor to himself and J. C. Tilton, Pittsburgh, Pa.

1st, I claim the gas tube, M, perforated, slotted, projecting above the cap, N, cut at the lower end and constructed as shown in fig. 2 of the accompanying drawing.

2d, The adoption of the tube or tubes, O, burning the oil direct in combination with the gas, constructed and operating substantially as and for the purpose set forth.

66,279.—MODE OF PREPARING OXYGEN AND APPLYING THE SAME TO USEFUL PURPOSES.—H. A. Archereau, Paris, France, assignor to himself J. M. O. Camin Despalles, Joseph de Susini, and E. O. Stern.

1st, I claim the process of decomposing sulphuric acid at its various degrees as found in trade, for obtaining oxygen therefrom, substantially as described.

2d, The hereinabove described and represented apparatus, and specially the apparatus for decomposing sulphuric acid, whatever may be the mode of heating employed.

3d, The compressing process for the better utilization of oxygen gas.

4th, The application or utilization of oxygen to all purposes, especially to metallurgic operations and to producing excessive high temperatures allowing of the most refractory bodies being melted without melting their containing capacities.

5th, The process for melting iron without carburetting or production of cast iron, in the manner and for the purposes hereinabove specified.

66,280.—CUTTER FOR PLANING MOLDINGS.—Edward John Arens, Boston, Mass.

I claim a molding cutter whose cutting edges for each member consists of diagonal faces meeting at the angle or ridge on the face of the cutter relatively to the form or contour of the molding, substantially as described.

66,281.—VENT PLUG.—James Bain, Brooklyn, E. D., N. Y.

1st, I claim the valve, C, nut, a, and spring, b, in combination with the seat, B, in the inner end of the plug, A, substantially as and for the purpose described.

2d, The movable seat, B, in combination with the valve, C, nut, a, spring, b, and plug, A, substantially as and for the purpose set forth.

3d, The air chamber, D, and cup, E, in combination with the plug, A, and valve, C, constructed and operating substantially as and for the purpose described.

66,282.—WINDLASS AND CHAIN STOPPER.—Wm. B. Baker, Marshfield, Mass.

I claim a ship's windlass or chain stopper, or both, composed of a plurality of shafts, A, provided with drums, C, and pulleys, E, with metallic straps, F, applied to them and all connected at one end to a single shaft, G, substantially as shown and described.

66,283.—RAILROAD SWITCH.—L. M. Batty, Canton, Ohio. Antedated June 12, 1867.

1st, I claim the combination of the lever, C, the post, B, the connecting rod, D, and the treadle, E, in the manner and for the purpose herein described.

2d, The adjustable plate, F, with its lugs, b, and notch, a, when combined with the treadle, E, and connecting rod, D, in the manner and for the purpose herein described.

3d, The treadle, E, when combined with the several devices, H I J K e and f, in the manner and for the purposes herein set forth.

4th, The casing, M, surrounding the outer part of the treadle, D, to protect the treadle and devices, H I J K e and f, from injury, as and for the purposes

66,284.—PLOW.—Henry F. Bemendefer and George Smith, Attica, N. Y.

I claim, 1st, The bar, D, spring catch, e, and spring, g, when used for shifting the standards, substantially as specified.

2d, The arrangement of the beam, A, bars, d f, standards, B B B', with their plows and the roller, b, when constructed, arranged, and used in the manner substantially as set forth.

66,285.—LADLE FOR POURING METAL.—H. W. Benton, Lebanon, N. H.

I claim the combination with a ladle of a guard or skimmer, substantially as and for the purpose described.

66,286.—SCAFFOLD.—Benjamin Best (assignor to himself and London Marts', Dayton, Ohio.

I claim, 1st, The combination of the uprights, A A', pivoted and adjustable braces, b C, pivoted sliding and supporting frame, B F G H, friction rollers, n, clip, d, with its appendages, pivoted spring catch, i, hinged planks, l, pulleys, E, and cord, h, operating in the manner described for the purpose specified.

2d, The clip, d, when made in one piece with the lugs, e, so that it serves to guide the supporting frame on the upright and to hold the windlass for raising and lowering the said supporting frame, as set forth.

66,287.—MACHINE FOR CUTTING CORN STALKS IN THE FIELD.—Henry Bilharz, Seneca, Ill.

I claim, 1st, The peculiar construction of the cutting apparatus, D D, consisting of the plates, a a, and the double-edged knives, b b, substantially as and for the purpose described in the foregoing specification.

2d, The lever, E, in combination with the knives, b b, and the plates, a a, substantially as and for the purpose described.

3d, The lever, I, in combination with the hinged shelves, G G, substantially as and for the purpose described.

4th, The railing, L, in combination with the cutters, D D, the lever, I, and the shelf boards, G G, substantially as and for the purpose described.

66,288.—PHOTOGRAPHIC COPYING BOARD.—W. D. Blackman, Defiance, Ohio.

I claim, 1st, A photographic copying board made and operating, substantially as and for the purposes herein specified and described.

2d, The device for centering the picture that is held on the plate, F, said device consisting of the ratchet bar, d C, pinion, e, and shaft, D, all made and operating substantially as herein specified and described.

3d, The device for adjusting the focus of the picture that is held on the plate, F, said device consisting of the sliding block, B, nut, g, and screw shaft, E, all made and operating substantially as and for the purpose herein specified and described.

4th, The device for increasing the size of the frame for holding the picture to be photographed, said device consisting of the stationary disk, F, revolving disk, G, pins, j j, plates, H, and spring bars, m, all made and operating substantially as and for the purpose herein specified and described.

5th, The device for clamping the picture consisting of the revolving clutch, I, in combination with the stationary clutch, F, disk, G, pins, j and plates,

66,289.—CALENDAR FOR CLOCKS.—Alphonzo Boardman, Forestville, Ct., assignor to himself and N. C. Hubbell, New Haven, Ct.

I claim, 1st, The combination and arrangement of the cylinder, A, representing the days of the week upon its surface, with a ribbon upon two cylinders, D and F, arranged and operated so as to present the date corresponding to the day of the week.

2d, The combination of the wheel, G, and lever, H, provided with its two arms, a and b, with cylinders, D and F, arranged so as to release and hold the cylinders, substantially in the manner herein described.

66,290.—BOTTLE STOPPER.—R. F. Bocemsdes, Wallingford, Ct.

I claim the tube, b, the upper end cut to receive the screw, c, of the hollow head, d, having a hinged cap, the lower end flanged to support the rubber cylinder, a, all constructed and arranged in such a manner that the liquid shall be discharged from the bottle without removing the stopper, as herein shown and described.

66,291.—PAINT BRUSH.—J. Dean Bonney, Pembroke, Mass.

I claim the combination with the removable and adjustable metallic band which surrounds the bristles of the clasp and its tapering slide for holding the said band upon the brush, substantially as and for the purposes set forth.

66,292.—HAY RACK.—Charles G. Boyer, Greenfield, Ind.

I claim a hay rack with top rails, A', dovetailed to the standards, D, and ends connected by the plates and hooks, c c, in combination with the pivoted arms, a a, and cross pieces, B', for forming a portable rack provided with upright beams at one end and ladder to the other, substantially as set forth.

66,293.—PRESSURE FILTER.—C. N. Brock, Philadelphia, Pa.

I claim the combination of a force pump with a battery of filters, substantially as described, whereby I am enabled to use any desired number of filters in battery, thus filtering and decolorizing the sirup, whether the same be heated or not.

66,294.—MACHINE FOR CLEANING AND SOFTENING SHEEP SKINS.—James M. Brown, Boston, Mass.

What I claim as my invention is my above described process of treating skins, such being by a fulling mill and water and by collecting the waste wool in a screen or its equivalent, as set forth.

I also claim the combination and arrangement of the screen with the fulling mill having a discharging hole in its reservoir, as set forth.

66,295.—CHURN.—John F. Brown, New London, Ct.

1st, I claim the combination of the curved metallic bottom, B, with the sides and ends of the box, A, for the purpose of forming a water chamber in the lower part of said box, substantially as herein shown and described.

2d, The butter gatherer and worker, M, constructed, arranged, and operated substantially as herein shown and described and for the purpose set forth.

66,296.—GROMMET.—Wm. Brown, Middletown, Ct., assignor to Wm. W. Wilcox and Joseph Hall, Jr.

I claim the improved grommet having a cast metal flange united substantially as described to a sheet metal tube.

66,297.—MACHINE FOR CUTTING DOWN AUGERS.—E. O. & E. Carrington, Wallingford, Ct.

We claim the combination of the bit holding device, G, and the forming cams, L, with the mill or cutter, D, all constructed, arranged, and operating in the manner and by the means substantially as herein set forth.

66,298.—CONSTRUCTION OF HAMMERS.—Henry Cheney, Little Falls, N. Y.

I claim the combination of the cast iron socket, B, with the wrought-iron head, A, both made and connected substantially in the manner and for the purposes set forth.

66,299.—CAPSTAN.—David N. B. Coffin, Jr. (assignor to himself and Irah P. Spaulding), Boston, Mass.

1st, I claim the application of pawls to a capstan by means of a cast joint or hinge, in any manner so as to allow the pawl to operate in both directions.

2d, The employment of a side opening, g, in combination with the inclosed bolt, in the construction of a capstan.

3d, The arrangement of the inclined lifters made movable in combination with the lock notches or spaces, h, so as to be used both to slide the bolts out of connection automatically, and also at the pleasure of the operator.

4th, The arrangement of the inclined lifters, i i, in duplicate and in reverse order, in combination with lock notches or lugs and sliding bolts

5th, The arrangement of an elevated flat part, j, between two inclines arranged in reverse order, substantially as and for the purpose set forth.

6th, Radially sliding keys or bolts in combination with a retaining socket in one part and a locking space or shoulder in another of two parts of a capstan or windlass, to be connected and disconnected substantially as described.

7th, A roller or sheave arranged with its axis obliquely to the windlass and its axis, substantially as described.

8th, The employment of conical or cylindrical rollers arranged in combination with the spindle and barrel of a capstan or windlass, to relieve the friction incident to the side or transverse thrust, substantially as described.

9th, The arrangement of rollers longitudinally between the shoulder of the barrel and that of the spindle or bed plate, to sustain or support the barrel endwise.

10th, The arrangement of sliding bolts in sockets on the fulcrum gear, as described.

11th, The lifting and sustaining ring, r, in combination with the bolts or locking mechanism of a capstan, and inclined lifters arranged either on it, or an auxiliary part, x.

12th, The employment of an elastic or spring element interposed between the part bearing the pawl pockets and the fixed portion of the bed plate.

13th, The inclines, X, for automatically lifting the fulcrum gear, substantially as shown.

14th, Locking or clutching the center or first moving gear of a capstan to the lever head automatically, by interlocking lugs formed on each, substantially as described.

15th, The arrangement of a concentric, circular, or annular flange or rib, or flanges or ribs, s, between the spindle or hub and the rim or periphery of the bed plate of a capstan or windlass, substantially as described.

16th, The arrangement of a friction wheel between the two barrels of a capstan or windlass, with provision for connecting or disconnecting it to or from one or both, at pleasure.

17th, The application of the differential windlass to the friction mechanism of a capstan or windlass.

18th, The employment of the combined bearing and brake or friction shoe in the friction mechanism of a capstan or windlass.

19th, The employment of chain lugs spanning the groove in the chain wheel and made adjustable radially in sockets at the bottom and extending up the sides of the groove between the two cheeks of the chain wheel, substantially as described.

20th, The employment of keys back of said lugs, with or without the circular form, substantially as described.

66,300.—FARM GATE.—Albert W. Cox, Indianapolis, Ind.

1st, I claim the provision in a jointed gate of the latch E, and handle, E', connected in such a manner that the raising of the latch shall effect the elevation of the gate, substantially as described.

2d, I claim the combination of the gate, B C C1 C2, latch, E, handle, E', and arms, F F', arranged and operating in the manner and for the purpose set forth.

3d, I claim the arrangement of the parts, H I J K, for sustaining the gate and latch in their elevated position when the gate is opened, and permitting them to assume their normal position when the gate is closed, as described.

66,301.—MEDICAL COMPOUND.—A. M. Cox, Elizabeth, N. J.

I claim the medical compound composed of the ingredients mixed together in or about the proportions substantially as described, for the purpose specified.

66,302.—WATER-PROOF PAPER FABRIC.—L. M. Crane, Ballston Spa, N. Y.

I claim as an improved article of manufacture a water-proof paper fabric made substantially as herein shown and described.

66,303.—CONNECTING LINKS.—Robt. Creuzbaur, Newark, N. Y.

1st, I claim the two parts, A and B, each with one opening, pivoted together at p, with these openings on opposite sides, substantially in the manner as shown and described and for the purposes named.

2d, Strengthening the ends of the link subject to bending by shaping them in the manner named, the two parts forming the link, being pivoted together through the parts thus strengthened, substantially as set forth.

66,304.—SWAGES FOR UPSETTING SAW TEETH.—Joseph Crookes, St. Louis, Mo.

I claim the die stock, A, having the mortises for setting the die, B B', transversely in the stock and the passage, A2, when arranged and combined with the split die, B B', substantially as set forth.

66,305.—HARDENING PAN FOR CIRCULAR SAWS.—Joseph Crookes (assignor to himself and Joseph W. Branch), St. Louis, Mo.

1st, I claim the pan, A, when provided with the inclined ways, a, either with or without the rollers, a', substantially as and for the purpose set forth.

2d, I claim the clamp, B, for the purpose of confining the plates, C, in a true position while immersed in the bath in the pan, A, as described and shown.

66,306.—CHURN.—Jonathan Davison, Plymouth, Mich.

I claim the arrangement of the staff, D, provided with its tube, a, and dashers with the churn body, and the lever, F, provided with its swivel block, for the purpose of churning milk or cream, substantially as herein specified.

66,307.—REGISTERING STEAM GAGE.—David P. Davis, Jersey City, N. J.

I claim the combination with a pressure gage, or any equivalent therefor, of a marker of any suitable form, and revolving diaphragm disk, or its equivalent, when all combined and arranged together substantially as and for the purpose described.

66,308.—CORN PLANTER.—Sol. G. Deutler, Orangeville, Ill.

I claim the combination of the sliding valve plate, C, having a rigid arm, E, and a flexible arm, F, attached to its rear end with the hopper, B, beam, A, and operating wheel, G, substantially as herein described and for the purpose set forth.

66,309.—CAR COUPLING.—James Depeu and J. Darrah Hall, Peekskill, N. Y.

1st, We claim the sleeve, f, which holds the link, and the arrangement by which the sleeve and the coupling pin, C, are moved longitudinally in the drawhead, substantially as described.

2d, We claim a coupling with coupling links and sleeves, f, arranged in each drawhead, substantially as described.

3d, We claim the weighted lever, D, and the catch pin, E, in combination with the sleeve, f, and pin, C, arranged substantially as set forth.

66,310.—METHOD OF EFFECTING THE CEMENTATION OF RAILS, AXLES, ETC.—T. M. Dodds, Rotherham, England. Patented in England, Dec. 1, 1865.

I claim the conversion of an iron surface into steel by treating the same in a suitable cementing furnace with a mixture composed of charcoal or other carbonaceous matter, potash or other alkaline matter, and lime, or matter containing lime substantially as herein set forth.

66,311.—STEAM GAGES.—R. B. Donaldson and Emmett Quinn, Washington, D. C.

1st, We claim the construction of tubes for steam gages of india-rubber, gutta-percha, or other compounds, or other suitable material, substantially in the manner and for the purposes as herein set forth.

2d, The construction of hollow cores of metal, or other suitable material, supported by mandrels, substantially in the manner and for the purposes as herein set forth.

66,312.—SAFETY BRIDLE.—Daniel M. Donehoo, Beaver, Pa.

I claim the arrangement of the safety rein, F, and gag rein, H J, with the rings, E I L, operating as described and represented.

66,313.—SPITTOON ENVELOPE.—A. J. Doolittle, Hamden, Ct.

I claim the spittoon box, A, provided with a hinged cover, B, which is operated by means of the spring, c, and levers, a and d, substantially as and for the purpose specified.

66,314.—HORSE RAKE.—Samuel Eberly and George Hauck, Mechanicsburg, Pa.

We claim connecting the rake teeth to the swinging rake head by the combined use of the shanks, e, and their extended bearings in the boxes, i, and the reactionary springs, f, constructed, arranged, and operating substantially in the manner and for the purpose described and represented.

66,315.—MEDICINE.—J. Fischer, St. Louis, Mo.

I claim the chemical compound when composed of the ingredients and used substantially as and for the purposes set forth.

66,316.—SKATE.—John Forbes, New York City.

1st, I claim the slotted guide box, S, in which the slotted jaws, D, are adjustably secured and operated by means of the centrally pivoted plate, E, in the concentric slots, d, of which the ends of the bolts work, all constructed and operating as herein set forth for the purpose specified.

2d, The combination and arrangement of the longitudinally sliding plate, H, slotted plate, I, arm, G, and spring arm, F, pivoted slotted plate, E, slotted jaws, D, and slotted guide box, C, as herein set forth for the purpose specified.

66,317.—PATTERN FOR CASTING POT-HOLE COVERS.—William J. Fryer (assignor to himself and John P. Witbeck), West Troy, N. Y.

The chamber, d, in combination with the plate, B, and its chamber, g, fitted to occupy the cavity, f f, and to slide within the channel, h, substantially as described and for the purposes set forth in this specification.

66,318.—GLOBE VALVE FOR STEAM ENGINES.—Joseph J. French, Baltimore, Md., assignor to himself and Reuben A. McCauley.

I claim a globe valve having a wheel or lever, A, carrying a hollow screw, B, to operate the valve, C, by means of the stem, D, constructed and operating in the manner substantially as shown and described and for the purpose set forth.

66,319.—MANUFACTURE OF CLAY PIPES.—G. D. and H. A. Goodrich, Joliet, Ill.

I claim, 1st, The grooved disk, T, when applied to clay-pipe machine and arranged to descend, while cutting the pipe, with the same motion as the pipe.

2d, The combination of a suspended rotating disk or wheel, T, with one or more cutters, h.

3d, The weighted guide heads, U, when provided with arms, V, substantially as and for the purposes specified.

4th, The two-edged knives or cutters, h, provided with the heel or projection, t.

5th, The cams, I, provided with the springs, J, substantially as and for the purposes specified.

6th, The combination and arrangement of the cams, I, and springs, J, with the cutters, h, heel, t, and rotating disk, T.

7th, The combination and arrangement of the guide heads, U, with the weights, o and W, substantially as specified.

8th, The arrangement of the weights, o p, upon a single cord so as to increase the weights as they ascend, substantially as specified.

9th, The rests or ledges, z, in combination with a series increasing in lateral dimensions, operated by a single cord, substantially as specified.

10th, The arrangement and combination of the cross bars, Y Z, standard, l, and mandrel, K, with the cords, n, weigh s, o p, and ledges, z, substantially as and for the purposes specified.

11th, The combination and arrangement of a descending platform for receiving a vertical pipe constructed and arranged substantially as specified, with a rotating disk provided with cutters and descending with the same motion as the platform while cutting, substantially as specified.

66,320.—MANUFACTURE OF CLAY PIPE.—Horace A. Goodrich, Joliet, Ill.

I claim, 1st, The bridge, a, when located between the screw or feeding portion of the shaft, G, and the revolving core, F, of a mold in a clay-pipe machine, substantially as and for the purposes specified.

2d, The plate, B, when provided with a gathering flange, C, projecting inwards, and permanently attached, substantially as set forth.

3d, The plate, D, when provided with the outer portion, E, of the mold and made adjustable by means of the holes and bolts, b, substantially as described.

66,321.—FENCE POST.—A. W. Gore, Manhattan, Kansas.

I claim a post for fences, etc., made of sheet metal, provided with cross wires or rods, substantially as and for the purpose described.

66,322.—HAND SCOOP.—David N. Green, Cold Water, Mich.

I claim a cylindrical hand scoop with a flat base to prevent the same from turning over, as and for the purpose described.

66,323.—APPARATUS FOR RECTIFYING DISTILLED LIQUIDS.—C. Greslachas & L. Jarchow, New York City.

We claim, First, The arrangement of the receiver, A, provided with one or more dishes, D, and a water vessel, E, in combination with the rectifiers, G G1, provided with dishes D1 D2 D3 D7, K, water jackets, I I1 I2, water vessel L, and suitable connecting pipes, all substantially as shown and described.

2d, The arrangement of cups, d1 d2 d3 d7, in combination with the dishes D1 D2 D3 D7, and shelves, H, in the rectifier, G, substantially as and for the purpose set forth.

3d, The arrangement of dishes, K, with depressions, m, and descending tubes, n, in the interior of the rectifier, G, constructed and operating substantially as and for the purpose described.

66,324.—BUCKLES.—Henry C. Griggs (assignor to Holmes, Griggs & Smith), Waterbury, Ct.

I claim the herein described buckle consisting of the plate or frame, A, and

the looped tongue, B, formed so as to be inserted through the plate, and to operate substantially in the manner herein set forth.

66,325.—PERFORATING CIGARS.—Oliver Guinand, Vicksburg, Miss.

I claim, 1st, The hollow block, A, having the spikes, C, pivoted in slots or mortises in its walls, as and for the purposes described.

2d, The hollow block, B, having right-angled triangled slots or mortises, D, to receive, and for the passage of the spikes, C, and seated on the spring, a, in the block, A, substantially as and for the purposes described.

66,326.—STOP COCK.—George D. Hadley, Cincinnati, Ohio.

I claim the eccentric lever by which the valve is operated, the elastic disk, D1, the cap, D, confining the disk, D1, and the valve, B, with its guides, a, in combination with the shell of a water cock, the whole constructed and arranged substantially as herein shown and described for the purposes set forth.

66,327.—SUSPENSION BRIDGE.—A. S. Hallidie, San Francisco, Cal.

I claim the cables, C C, in combination with the suspension rods, D D, and girders, E E, all made and operating substantially as herein specified and described, and the rods, D, being made adjustable as set forth.

2d, The combination of the adjustable cables, C C, posts, A, rods, D, girders, E, and adjustable braces, G, with each other and with the flooring, F, all being made substantially as herein specified and described.

66,328.—RAILWAY CHAIR.—T. C. Hargraves, Boston Mass.

I claim, in combination with the chairs and rails of a railway track, an indented wedge and spring detainer, arranged to operate together substantially as described.

66,329.—BOILER FOR HEATING WATER.—C. A. Harper, Rahway, N. J. Antedated June 24, 1867.

I claim the boiler, A, having an internal flue or fire chamber, B, surrounding the pipe-formed water heater, C, through which the water in the boiler circulates by means of pipes, D D1, said parts being constructed and arranged for use, substantially in the manner and for the purpose set forth.

66,330.—PROPELLING CABLES FOR RAILROAD GUIDES.—Chas. T. Harvey, Tarrytown, N. Y.

1st, I claim the cable heads or ferrules hereinabove described, having plain operating faces so that they act on the cable clutch or arm, C, of a car, by simple contact therewith, substantially as described.

2d, I claim the horizontal roller, E, on the under side of the cable head, in combination with the supporting vertical rollers, substantially as described.

3d, I also claim the combination of the vertical supporting rollers of the cable head, A', with the upper horizontal rollers, D D, and the lower horizontal roller, E, all placed and operating substantially as set forth.

4th, I also claim the vertical spur, B, of the cable head or ferrule projecting above the top of the cable guide, substantially as described.

5th, I also claim the beads, a a, of the cable guide, in combination with the cable heads or ferrules, A' of a propelling cable, substantially as described.

6th, I also claim the ledges, t t, of the cable guide, in combination with the cable head or ferrule, substantially as shown.

7th, I also claim the steam pipe, r, in combination with a cable guide, substantially as described.

66,331.—NAIL.—Hayward A. Harvey, Orange, N. J.

I claim the combination of the head of a nail with one or more cavities and protuberances or ratchets upon the sides and edges of the shank thereof, substantially as described, whereby the lateral diameter or width of the shank is increased as shown.

66,332.—SCREW CLAMP FOR PLANKING VESSELS.—James D. Hathaway, Medford, Mass.

I claim a screw clamp consisting of a frame, a male and female screw, and serrated cam, combined and operating substantially as described.

66,333.—GRAIN SCREEN.—Reason Hawkins, Palestine, Ind.

I claim the arrangement of the screens, h and m, and the cross bars, K K, in the box, D, and the trash screen, e, at the head of the box, in combination with the octagonal roller, E, operating as and for the purposes herein described.

66,334.—SORGHUM EVAPORATOR.—B. R. Hawley, Normal, Ill., assignor to himself, E. Washburn, and C. A. Montross.

1st, The construction of an evaporating pan in such a manner as to create a continuous upward and downward flow of the boiling sirup, as represented by the arrows, a a, substantially in the manner and for the purpose set forth.

2d, I claim the filtering pockets, D, in combination with the boiling pans or defecator of an evaporating apparatus, substantially in the manner and for the purpose set forth.

3d, I claim the cooler, E, in combination with the finishing pan, C, as described and set forth.

4th, I claim filtering the boiling sirup by continuously passing the surface fluid down through a filtering substance in the pocket, D, to the bottom of the boiler, substantially in the manner and for the purpose set forth.

5th, I claim the strainers, D', in combination with the boiling pans or defecator, and the pockets, D, substantially as described and set forth.

66,335.—PLOW.—James M. Hawley, Holton, Ind.

1st, I claim the standards, H and E, constructed substantially as herein described, in combination with the shovels, K and G, and beam, A, in the manner and for the purpose set forth.

2d, The combination of the handles, B, and forked and slotted connecting bar, C, with the beam, A, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the bent bars or frame, M, with the beam, A, and standards, H, substantially as herein shown and described and for the purpose set forth.

4th, The combination with the scraper plate, P, with the forward standards, H, substantially as herein shown and described and for the purpose set forth.

66,336.—BEEHIVE.—Jasper Hazen, Bethlehem, N. Y.

I claim the combination of the central apartment, g, the movable partitions, d d, and the side surplus honey boxes, I I, arranged in the manner described.

66,337.—DETECTING COUNTERFEITED BANK NOTES, ETC.—Laban Heath, Boston, Mass.

I claim the mode of detecting counterfeit bank notes by the means of impressions made from duplicates of parts of the genuine dies or plates mutilated, substantially in the manner set forth.

66,338.—MODE OF TREATING BAMBOO CANE AND OTHER FIBROUS PLANTS.—Charles Heaton, New York City.

1st, I claim saving and utilizing the resinous and other soluble portions of vegetable fibrous matters which are usually washed out and wasted, in the manner set forth.

2d, The employment of alum or acid, in paper making, whenever the same is so applied as to precipitate that portion of the gum which is now washed out and wasted.

3d, In the disintegration of vegetable fibrous matter, when an alkaline solution has been used and become discolored or opaque, or partially so, I claim the employment of alum, and for precipitating the suspended matter or clarifying the solution, as herein set forth.

66,339.—CHIMNEY.—Jacob Heed, Temperanceville, Ohio.

I claim, in a chimney constructed as described, the projections, A A, and the diaphragms, B D, one or more, each provided with an aperture, and arranged substantially as described and for the purposes specified.

66,340.—CULTIVATOR.—Stephen H. Herrick, Grinnell, Iowa.

I claim the frame, B, turned up and threaded at its forward end, and connected to and regulated at the rear end of the beam by the bolt, D, as and for the purpose set forth.

66,341.—ROOF AND CLAPBOARDING BRACKET.—H. W. Holden, T. J. Mooers, D. H. Stratton, and G. Reynolds, Bloomsburgh, Pa.

1st, We claim a combined roofing bracket, A, support, C, and brace, D, when made and operating substantially as herein shown and described.

2d, The bracket, A, when combined with a truss, B, both made and operating substantially as herein shown and described.

3d, The bracket, A, with a hook, d, and platform, e, substantially as and for the purposes herein shown and described.

4th, The truss, B, with a brace, i, hook, h, and lug, j, and pins, l, substantially as and for the purpose herein shown and described.

5th, The support, C, with a hook, h, pin, j, and pins, n n, substantially as and for the purpose herein shown and described.

66,342.—GRADUATING LEVEL.—Nathan Hollingsworth, Rosetta, Ill.

I claim the weighted arbor, l, and arms, m, with index, n, traversing over the scale, p, in combination with the telescope, A, and brake, g, constructed and operating substantially as and for the purpose described.

66,343.—SHIFTING RAIL FOR CARRIAGES.—Henry F. Holt assignor to himself J. Thaddeus C. Abbott, Fredonia, N. Y.

I claim a self-fastening shifting rail for buggy tops, constructed substantially as herein described.

66,344.—RAILROAD GATE.—Nelson Houck, Canton, Ohio.

I claim, 1st, The peculiar arrangement and combination of the part, L, of the rail, L M, the rods, c d, rock lever, i m, rods, O P, and turning plate, B, the several parts being arranged as and for the purpose set forth.

2d, The peculiar arrangement and combination of the turning plates, B C D E F, rods, S T t1 a b t2, S2 T2, connecting rods, A A, bars, g h, and combined levers, p p, q q, the several parts being arranged as and for the purpose set forth.

3d, The spring, V1, when used in connection with the axle, V, of the turning plate, D, substantially in the manner and for the purpose specified.

4th, The rods, A3, with springs, a3, when used in connection with the part, L1 of the compound rail, L1 M1, substantially in the manner and for the purpose specified.

5th, The vertically slotted holes either in the part, L1, or the part, M1, of the compound rail, L1 M1, when such slots are used for the purpose of allowing a vertical motion to the part, L1, substantially in the manner and for the purpose specified.

66,345.—BOAT DETACHING APPARATUS.—W. H. Houston, New York City.

I claim the combination of the catch pawl, P, locking bar, h, and spring m, with the lock frame the whole arranged to operate as described for the purpose set forth.

I also claim an automatic boat eye or lock so constructed as to unlock when the weight of the boat rests fairly on the water, substantially as herein before described.

66,346.—FRUIT BOX.—William Huey, Galena, Md.

1st, I claim as a new article of manufacture the fruit and vegetable box with the lid all constructed substantially as set forth.

2d, The lock, H, composed of the plate, b, with a key hole, the hooked plate, l, and the spring, l, arranged substantially as set forth.

3d, The slats, a, notched slats, g, and rabbeted corners, e, in combination with the rabbeted rim, b, and rivets, c.

4th, The slats, a, notched slats, g, rabbeted corners, e, and locks, H, in combination with the lid, p, substantially as set forth.

66,347.—VIOLINS.—G. H. Hulskamp, New York City.

1st, I claim the straining of sounding boards in violins and other instruments before named and referred to of whatever material made, by the tension and pressure of the strings, substantially as herein before described.

2d, Transmitting the vibrations of the strings by posts or pulleys braced to different points of the upper and lower sounding boards and making the feet of the bridge, K, to bear upon the oblique braces, substantially as described.

3d, Making the finger board and string holders in one piece with an orifice, O, for the bridge, K, and connecting the same with the oblique brace, d d, substantially as set forth.

4th, Securing the strings directly on the end of the extended finger board at p p p, substantially as described.

66,348.—BEE HIVE.—Sam. Hutchinson, North Lewisburgh, O.

I claim the endless apron, G, provided with cleats, e f, and placed underneath the body or main portion of the hive, substantially as and for the purpose herein set forth.

66,349.—SIRUP PITCHER.—John Hyslop and C. E. Phillips, Abington, Mass.

We claim the block, F, applied to the lid or cover of a sirup pitcher, substantially as and for the purpose described.

We also claim the spring, E, or its equivalent in combination with the cover or lid, B, substantially as described and for the purpose specified.

66,350.—BED BOTTOM.—W. B. Ingersoll, New York City. Antedated June 27, 1867.

I claim the combination of the pulleys, c, around which the cord, r, passes, the cross bar, a, to which the pulleys are attached, the movable arms, b, the windlass, g, and the springs, f, under the arms or head-piece or cross bar, all as and for the purpose specified.

66,351.—DOUGH KNEADER.—C. C. Johnson, Springfield, Vt.

1st, I claim the combination of the revolving standard, B, lever, C, and one or more rollers, F, and cross pieces, D, substantially as and for the purpose set forth.

2d, The combination of the cross piece, D, when formed to set as a scraper and the roller, F, when attached to a lever, C, operating substantially as and for the purpose set forth.

66,352.—HORSE RAKE.—Sylvester Johnson, New Harmony, Ind.

1st, I claim the combination of the lever, M, chain or rod, L, arm, K, pivoted sash or frame, I, pawls, O, with the shaft of the rake head, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the arm, P, and link, R, or its equivalent with the arms, K, notched rake teeth and sash, I, substantially as herein shown and described for the purpose specified.

66,353.—BLEACHING PAPER PULP.—W. C. Joy, and John Campbell, Penn Yan, N. Y.

We claim treating paper pulp of all kinds with air pure or mixed at any temperature by causing a current or currents of air to pass through the mass by means of a forced blast or current or by an exhausting fan or pump that will cause sufficient air to pass through the mass to accomplish the result specified, substantially as and for the purpose specified.

66,354.—GEAR CUTTER.—H. N. Keables, Worcester, Mass.

I claim a gear cutting tool of continuous operation by revolving the cutting teeth, of which are arranged radially at equal distance from their center of revolution groups leaving equidistant and equalized clearing spaces between said groups and otherwise constructed substantially as and for the purpose set forth.

66,355.—BRICK MACHINE.—Philip H. Kells, Adrian, Mich.

1st, I claim the bed plate, B, formed with the annular flanges, B' B', for the reception of the pug mills, F F, substantially as described.

2d, I claim the cut off plate, J, arranged and operating in the manner and for the purpose specified.

3d, I claim the bed plate, B, when supported so as to be adjustable in relation to the mold wheel substantially as described.

4th, I claim the adjustable incline, L, arranged and operating in the manner and for the purpose explained.

5th, I claim the reversible knife, N, formed with cutting edges on its opposite sides and arranged and applied to operate as set forth.

6th, I claim the combination with the knife, N, of the clay guard or shield, N' arranged and employed in the manner and for the purpose set forth.

7th, I claim the combination with the wheel, I, of the adjustable supporting frame, F', stationary base plate, P2, projections, p p, screw bolt, p3, and nut, p3, substantially in the manner and for the purpose specified.

8th, I claim the arrangement of the intermediate gear wheels, I2 I2, in connection with the mold wheel, E, and cog wheels, I1 I1, as herein described and represented.

66,356.—WASH OR STEEP FOR ROOTS, SEEDS, ETC.—P. G. Kenny, Rahway, N. J.

1st, I claim a wash or steep for seeds, roots, trees, plants or vines composed of sulphate of iron dissolved in water in or about the proportions described and for use in manner, substantially as specified.

2d, Sulphate of iron dissolved in or admixed with urine or chamber lye, to form a wash or steep, essentially as and for the purpose or purposes herein set forth.

66,357.—MANURE.—P. G. Kenny, Rahway, N. J.

I claim a fertilizer composed of farm or stable yard manure or other suitable animal or vegetable substances decomposed, or having sulphate of iron admitted with or dissolved in it or them by the passage of urine therethrough, substantially as specified.

2d, The employment of aluminous earth in connection with stable yard manure or other animal or vegetable substances and sulphate of iron as a fertilizer, essentially as herein set forth.

66,358.—MACHINE FOR DIGGING POTATOES.—Henry Kewley, Perry, Ohio.

1st, I claim the employment and use of the belts, K K' and pullies, J J J,' J2, fig 6, when arranged to operate substantially in the manner and for the purpose herein specified.

2d, The employment and use of the digger, herein described and shown in fig. 3, consisting of blades, L, constructed as described secured in series on the seat, L,' constructed as described, journals, d, and handle, M, located and operating as and for the purpose specified.

3d, The combination of the hooked fingers, F, conveyor belt, E2, digger fig. 3, and inclined screen chute, H, arranged and operating substantially as and for the purpose set forth.

4th, The employment and use of the lift rods, R R, constructed as specified and shown in Fig. 6, and made adjustable in the manner described and shown in fig. 7 all located and operating in combination with the belts, K K' as and for the purpose herein set forth.

66,359.—CAR REPLACER.—Charles King, Morristown, N. J.

1st, I claim the inclined planes, B B, in combination with the pivoted rail, D, on B', and the clamps, C, all constructed in the manner as and for the purpose set forth.

2d, The arms or anchors, E, fitted or pivoted in bars, F, clamped to the rails, A A, in combination with the cables or chains, H, and the windlass, J, on the axle of the engine, said parts being arranged substantially in the manner and for the purpose specified.

66,360.—THROTTLE VALVE GEAR.—Norman King, Etna, Pa.

I claim the standard, A, and the levers, B and F, with the arms C, and G, constructed, arranged and operating substantially as shown and described for the purpose set forth.

66,361.—CRADLE.—S. W. Knowles, New Haven, Ct.

1st, I claim the arrangement of the levers, D and E, pivoted to the cradle, C, and to the frame, A, constructed and arranged so as to operate substantially in the manner herein set forth.

2d, The arrangement of the guide, G, in combination with the cradle, C, so as to prevent the lateral movement of the cradle and operate substantially as herein set forth.

3d, The arrangement of the block, I, in combination with the cradle, C, and levers, D and E, so as to operate as and for the purpose specified.

66,362.—CLOTHES WRINGER.—C. H. Knox, Mount Pleasant, Iowa.

1st, I claim the arrangement and combination of lever, M, hinged to box, A, roller, L, rods, K, levers, I, and plate, C, arranged to operate upper roller, D, as set forth.

2d, The double cog wheel, P P, arranged to operate in combination with double pinion, S, for turning the rollers, D D, substantially as described.

66,363.—WASHING MACHINE.—Ira A. Livingston, Hornellsville, N. Y.

I claim the arrangement of a series of vibrating wash boards, E, E, operated by levers, e, e, in combination with double or triple cranks and fly-wheel motion, substantially as and for the purposes herein set forth.

2d, I claim the rubbers, E, E, as constructed in combination with the rod, F, springs, f, i, cords, j, j, pulleys, i, i, and foot-piece, a, as and for the purpose described.

66,364.—BURNING FLUID.—Wm. R. Loomis, Nelson Wells, Harmon Hitchcock, and Samuel G. Stryker, Elmira, N. Y.

We claim the manufacture for sale of a burning fluid (crystallized oil) made by adding to 40 gallons of naptha, 2 lbs. of alum, 2 lbs. common salt, 1 lb. potash, and 4 oz. camphor gum finely pulverized, and half a pint of spirits of nitre.

We also claim the use of potash when it is combined with substantially the substances mentioned, for the purposes of making a burning fluid as described.

66,365.—SOAP STONE STOVE.—Albion K. Lowell, Manchester, N. H.

I claim a metallic fire pot, C, in combination with an outer casing of soapstone placed at such a distance as to leave an air space between the two, suitable openings, c, being provided at or near the bottom of the stove, to admit cold air to the lower portion of the fire pot, all constructed and operating substantially as and for the purpose set forth.

I also claim the soapstone casing, B, B', held together by a series of bands, a, b, the latter, b, being so constructed and arranged as to have openings, c, for the admission of air substantially as and for the purpose set forth.

66,366.—LAMP SHADE CLASPS.—John J. Marcy, (assignor to E. Miller & Co.), West Meriden, Ct.

I claim the combination of the two rings, A and C, with the springs, B, when the said springs, B, are formed so as to hold the ring, C, substantially as and for the purpose specified.

66,367.—CLAMPS FOR SUSPENDING WHIPS.—Alvin C. Mason, Boston, Mass., (assignor to self and H. H. Mason), Springfield, Vt.

I claim a clamp for suspending whips, constructed with a pivoted or jointed jaw, one or more arranged so that the clamp may be opened by means of a cord or its equivalent to receive the upper end of a whip, substantially as shown and described.

66,368.—GATES.—E. A. Matthiesen, Cornwall, N. Y.

1st, I claim the fixed double inclined plane, f, and the two vertically moving inclined planes, g, m, in combination with each other, and the laterally swinging gate, A, substantially as and for the purpose specified.

2d, The laterally moving plate, n, and the weights or catches, b, b*, in combination with the levers which operate the inclined planes, g, m, whereby the gate is retained in an open position, substantially as herein set forth.

3d, The levers, h, h*, levers, i, i*, and vertical rods, k, k*, arranged in relation with each other and with the inclined planes, g, m, and the arm, c, of the gate, A, substantially as and for the purpose specified.

4th, The vertical bars, t, levers, s, and links, s*, arranged with reference to each other and to the lever, r, and plate, n, whereby the said plate may be operated to hold and release the weights or catches, l, l*, substantially as herein set forth.

5th, The guides, D, plates, w, and aprons, x, arranged in relation with each other and with the vertical rods, k, k*, and bars, t, substantially as herein set forth for the purpose specified.

66,369.—SUGAR CRYSTALLIZING TANKS OR WAGONS.—Franz O. Matthiessen, Jersey City, N. J.

I claim the combination with the tank or wagon of an air pipe or air pipes or tubes arranged to project through the body of the tank and open at its or their ends with a valve or valves to exclude or control the circulation of air, substantially as and for the purpose or purposes specified.

66,370.—VACUUM PANS FOR BOILING SUGAR AND OTHER SUBSTANCES.—Franz O. Matthiessen, Jersey City, N. J.

I claim the combination of an umbrella or cap or cover of open work construction with the dome or cover to a vacuum pan constructed to form an escape outside of the boiling vessel for the condensed vapor and provided with a Torricellian discharge pipe or tube, said umbrella being arranged within the dome and over the boiling vessel or chamber, essentially as and for the purpose herein set forth.

66,371.—COMBINED MEASURE, FUNNEL AND FAUCET.—G. W. McCann, Springfield, Ohio.

1st, I claim the combined faucet and funnel herein described, constructed so that the same may be used in connection or separately.

2d, In combination with the funnel, D, the conical strainer, H, constructed and arranged as set forth.

66,372.—DRILLING AND PUMPING APPARATUS.—Mark T. McCormick, Meadville, Pa.

1st, I claim the ram, G, in combination with the rack, N, the segment, M, and the wheels, H and Y, with the lever, D, the swinging frame, E, when the same are constructed as described for the purposes set forth.

2d, I claim the pumping attachment described, fig. 6, consisting of the frame, t, t, the pitman, l, constructed as described, in combination with the drilling device as described for the purposes set forth.

66,373.—SLEIGH RUNNERS FOR BUGGIES.—John S. McIntire, Chicago, Ill.

1st, I claim the pipe box, B, provided with flanges, a, and arm, C, constructed substantially as and for the purposes specified.

2d, The hook, D, set screw, E, and pipe box, B, in combination with the axle G, and runner, A.

66,374.—REGISTERS.—John McLaughlin, Brooklyn, N. Y.

I claim the screen, B, to register substantially as and for the purpose described.

66,375.—APPARATUS TO CURE HORSES OF CRIBBING.—G. W. Metcalf, Hummelstown, Pa.

I claim the combination of the bow, A, spar, B, and the two spring shields, C, C, constructed and arranged as and for the purpose herein specified.

66,376.—MACHINE FOR DISINTEGRATING PEAT.—Abraham Michelbacher, New York City.

1st, I claim one or more vibrating digging rakes arranged upon a suitable carriage, substantially as and for the purpose herein set forth.

2d, The combination with a vibrating digging rake constructed and operating as described of an adjustable roller E, substantially as and for the purpose herein set forth.

3d, A caster wheel or roller operated by a lever b, and arranged in relation with the frame of the carriage and the vibrating digging rake or rakes substantially as and for the purpose herein set forth.

4th, The crank shaft F, balance wheel r, pinion n, and driving gear wheel A*, arranged in relation with each other and with the supporting wheels of the carriage and the vibrating digging rakes substantially as and for the purpose herein set forth.

66,377.—APPARATUS FOR TREATING CANE JUICE WITH SULPHUROUS ACID GAS.—Theodule Morrillon, and Ursin Naquin, Parish of La Fourche, La.

We claim a tight wooden box provided with pipes of induction and eduction for cane juice, and also with a pipe for introducing sulphurous gas therein to saturate the juice with sulphurous acid by mechanical agitation thereof substantially as and for the purpose herein described.

66,378.—POWDER FOR FIRE ARMS AND FOR BLASTING.—Gustav Adolph Neumeyer, Altenburg, Germany.

I claim a blasting and explosive powder when made of the ingredients and in the manner herein set forth.

66,379.—ROOF FOR RAILROAD CAR.—J. Palmer, Cleveland, O.

I claim the construction and arrangement of the metal plates or sheets E, when lapped or hooked continuously together substantially as herein described and shown in combination with the caps F, the cleats sheathing or resting surface C, cornice D, and carlines or rafters B, all constructed and arranged substantially as and for the purpose herein set forth and described.

66,380.—DRAIN FOR WASTE WATER.—C. H. Parker and G. N. Copeland, (assignors to Charles H. Parker,) Cortland, N. Y.

1st, We claim the conducting waste water or other liquids into the earth, by means of the pipe a, or its equivalent either down to water, or to a strata of earth sufficiently porous to absorb or drain off such liquids.

2d, We claim the pipe a, in combination with the conductor c, and strainer d, (where such strainer shall be necessary) as and for the purposes above described.

66,381.—SEALING WAX STAMPS.—John H. Parsons, Quincy, Mich.

I claim the arrangement of the standard A, constructed with a lamp n, rack E, the adjustable table C, and moistener k, substantially as described and set forth.

66,382.—WATER WHEEL.—Thomas Pattinson, Little York, Cal.

I claim the construction and arrangement in the case C, of the water wheel A, provided with the buckets c, whose under sides d, are beveled, the pen stock E, having supply pipe or tube F, and provided with the gate H, operated by the screw I, the removable discharge tube G, attached to its under side, whereby the water under static pressure is delivered in a perpendicular column upon the buckets c, substantially as herein shown and described.

66,383.—SETTEE FOR SCHOOL ROOM.—John Peard, New York City.

1st, I claim a settee constructed of cast iron side pieces A, cast entire with cleats or projections to form grooves to receive the ends of the plank seat B, and the lower plank B, and the ends of the planks or back strips C C, and also cast with lips b c, through which screws pass to secure said planks in position, substantially as and for the purpose set forth.

2d, The fixed bracket D, cast with one or more of the side pieces A, substantially as and for the purpose specified.

3d, The adjustable or sliding bracket E, fitted on a dovetail cleat d, of one of the side pieces, substantially as and for the purpose set forth.

66,384.—SCHOOL SETTEE AND DESK.—John Peard, New York City.

1st, I claim the sliding desk E, containing the metallic strips a*, arranged in the manner substantially as and for the purpose set forth.

2d, The seat F, provided with slotted metal bars or strips f, at its ends in combination with the pivoted supports G G, having pins h, at their upper ends to work in the slots of the bars or strips f, substantially as shown and described.

3d, The combination of the sliding desk E, with the pivoted seat F, and supports G G, and the side pieces A A, all arranged substantially as and for the purpose specified.

4th, The book and slate racks C D, in combination with the desk E, pivoted seat F, and side pieces A A, substantially as and for the purpose set forth.

66,385.—CAR COUPLING.—John Pettengill, Jr., Lisbon, N. H.

I claim the combination of the box, A, link, C, springs, D, and elbow plate, E, with each other, all made and operating substantially as herein shown and described.

66,386.—STRAW CUTTER.—S. Pettibone, Corunna, Mich.

I claim, 1st, Operating the feed rollers by means of a toothed arm, G, and cogs, F, formed upon the hub of the knife lever, E, substantially as herein shown and described.

2d, The combination of the ratchet wheels, O J, the pawls, I N, connecting rod, L, and lever, H, with the feed rollers, K H, and toothed arm, G, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the adjustable guide arms, M S, guide rods, T, and coiled spring, U, with the metallic side pieces, R, and with the upper feed roller, P, substantially as herein shown and described and for the purpose set forth.

66,387.—BOILER TUBE SCRAPER.—E. L. Pratt, Boston, Mass.

I claim, in combination with a series of scraping blades arranged as described, a sliding rod by movement of which the scraping edges may be expanded or contracted when they are within a tube, substantially as described.

Also in combination with the blades and their shanks and the movable rod, the springs upon which the shanks are cushioned when the blades are expanded, substantially as set forth.

66,388.—BALING PRESS.—A. J. Purviance (assignor to himself and J. A. Moss), Mount Zion, Ohio.

I claim, 1st, The combination and arrangement of the sliding pinion, d, rack beam, C, spur wheel, i, pinions, e g p, sliding shaft, P, spur wheel, I, windlass, E, swinging frame, H, shaft, F, loose block, G, ropes, h l k' pulleys, z z, roller, i I', constructed and operating in the manner as and for the purpose specified.

2d, I claim the windlass, E, in combination with the guide pullies in the block, G, the rope, r, the adjustable frame, H, and the rack beam, C, arranged and applied to compress the bale, substantially in the manner herein described.

3d, I claim the shifting levers, m and n, in combination with the shifting shaft, P, the shifting pinion, d, and the rack, c, constructed and applied substantially as and for the purposes herein set forth.

66,389.—ICE-CREAM FREEZER.—John H. Rae, Syracuse, N. Y.

I claim, 1st, The combination of the open cylinder, C, and raised bottom, A', of the can, A, substantially as described for the purpose specified.

2d, The beater, C, with double spring scrapers, c c, in combination with the can, A, and internal cylinder, B, constructed and operating substantially as and for the purpose set forth.

3d, The funnel cover, E, in combination with the can, A, and internal cylinder, B, constructed and operating substantially as and for the purpose described.

66,390.—BED BOTTOM.—C. D. Read, Burlington, Vt.

I claim the combination and arrangement of the slat, A, with blocks, D, and rail, B, with its hooked nails, x x and d, with coil spring, C, and strap, a, when constructed and used in the manner and for the purposes specified.

66,391.—HARNESS HOOK.—I. C. Richmond (assignor to J. N. Hough), West Meriden, Conn.

I claim a hook having toe bar, D, formed upon the point of the hook each end of the said bar extending down and partially around the shank of the hook, in the manner and so as to operate substantially as set forth.

66,392.—VALVE GEAR FOR STEAM ENGINES.—A. K. Rider, Nazareth, Pa.

1st, I claim the combination with the reciprocating piston, B, and main valve controlling the same, of a regulator so constructed and operating as not only to admit of the valve stroke being lengthened or shortened to change the speed or force of engine strokes but also of being so varied in position relatively to the engine cylinder ports as to secure, when required, to the engine piston a more forcible stroke in one direction than the other, substantially as specified.

2d, The regulator to the engine cylinder valve, arranged and operating substantially as described.

3d, The arrangement of the sub valve, J, relatively to the main valve, G, the one being controlled by the other, as specified, when said valves have a common inlet and exhaust and are otherwise arranged for operation together, substantially as specified.

4th, The combination of the arm operated by the engine piston of the

block, N, lever, O, spring, r, to the sub valve, J, lever, S, and detent lever, P, operating in connection with the rests, lifting nuts, or stops to operate the sub valve, as herein described.

5th, The combination with the engine piston, of a sub valve operated thereby main valve controlled by the sub valve and regulator governing the action of the main valve, essentially as and for the purpose or purposes herein set forth.

66,393.—DEVICE FOR SUPPORTING HOP VINES.—N. C. Roberts and E. W. Badger, Fly Creek, N. Y.

We claim the chain, A, secured to the posts, B, provided with rings, C, encircling the bearing poles, D, in the manner and for the purpose represented and described.

66,394.—COTTON PRESS.—S. D. Roberts, Washington, La.

I claim the double lever, H H, connected by toggles, G G, with the follower block, F, in combination with the capstan, I, the drums, e e and K, and the hoisting rope, h, when employed in a baling press, arranged and operating substantially as herein described.

66,395.—LIQUID METER.—William Robjohn, New York City.

1st, I claim the combination of the reciprocating piston, G, with its rod, b, measuring cylinder, E, with tight box or case, I and lever, H, all for operation together and with outside mechanism, substantially as specified.

2d, The combination with the shaft, c, of the lever, H, of the arm, J, slotted bar, K, lever, L, double inclined plate, M, and roller, j, for operation together, as herein set forth.

3d, The combination of the lever, O, slotted bar, F, provided with studs, r, in mangled rack gear with a double toe, Q, and driver, q, furnished with teeth, r, essentially as and for the purpose specified.

4th, The longitudinally sliding spring horse wheel, Y, having an aperture x, in combination with a locking stop, w, and geared with a stop cock, W, for control of the latter, substantially as herein set forth.

5th, The rod, Y, operated as described, spring catch, c2, and stop cock lever or handle controlled by a spring, all for operation together, essentially as and for the purpose or purposes specified.

66,396.—SHOE LACING.—Adolph Rock, Foxborough, Mass., and William Moorhouse, Mansfield, Mass.

We claim the combination and arrangement of the shoe lacing consisting of the grooved rollers, B, pivoted between the arms, A, in such a manner that an opening, C, shall be left in said arm inside of said rollers, said arms secured opposite each other upon each side of the slit in the shoe or upon a frame, D, substantially as described for the purpose specified.

66,397.—STEAM GENERATOR.—Hiram Rosbrook, Chicago, Ill.

1st, I claim in a steam generator the use and employment of the tube, F, for the purpose and in the manner substantially as described.

2d, Combining the tube, F, with the flues, C C C, in the manner substantially as described.

3d, Combining the reservoir, D, pipe, F, and flues, C C C, substantially as described.

66,398.—BEDSTEAD.—Andrew Rothwell, Washington, D. C.

I claim so disposing the slats of bedsteads as to produce a curved depression therein adapted to the form of the human body, substantially as described and represented.

66,399.—GUN HAMMER GAGE.—W. H. Round, Middletown, Conn.

I claim a gun hammer gage consisting of the plates, A B and D, constructed and arranged so as to be adjustable, substantially as and for the purpose set forth.

66,400.—WINDOW FASTENER.—C. H. Sawin and J. A. Titus, Worcester, Mass.

1st, We claim the combination of the recessed holding plate with the bolt under the arrangement herein described so that while the locking end of the bolt slides under and parallel with the plate its opposite end shall project up so as to be flush with or to extend above the said plate, substantially as and for the purposes set forth.

2d, The combination of the bolt with its spring formed in the manner herein specified so that the bolt shall be both held in place and pressed forward by the action of the said spring as and for the purposes set forth.

3d, The combination with the recessed holding plate of the sliding bolt and its spring, the whole being arranged for operation substantially as shown and described.

66,401.—HORSE-POWER.—John Schley, Savannah, Ga.

I claim the arrangement of the vertical gear wheels, K, upon the horizontal shaft, L, secured to the vertical shaft, M, and pivoted on the post, D, meshing into the horizontal gear wheel, H, turning loosely upon the post, D, said wheel, H, provided upon its under side with horizontal shafts, b, upon which the vertical gear wheels, G, are supported, the latter meshing into the stationary wheel, B, and double cogged revolving gear wheel, A, substantially as described for the purpose specified.

66,402.—VEGETABLE CUTTER.—J. M. Schwartz, Philadelphia, Pa.

I claim the plate, A, with its knife, d, in combination with the adjustable plate, A', and the set screws, F, or its equivalent, the whole being constructed and operating substantially as described.

66,403.—CLOTHES-LINE HOLDER.—A. J. Simpson, Washington, D. C.

I claim the clothes-line holder consisting of the swinging lock, C, and hook, B, constructed and arranged substantially as described.

66,404.—BALING PRESS.—W. B. Smith, Aberdeen, Ind.

1st, I claim the arrangement of the drums, f1 f2, clutch, b', ropes, g1 and g2, pullies, f and g3, lever, G, and links, b b, for the purpose of operating the follower, B, substantially as and in the manner herein shown and described.

2d, I claim the arrangement of the collar, i, rope, i', pullies, i'', rocking frame, l, weight, M, and link, c, for the purpose of operating the beater, C, substantially in the manner herein shown and described.

3d, I claim the combination of the collar, i, projection, i', and catch, K, with the incline, m, substantially in the manner and for the purpose herein shown and described.

66,405.—WAGON-HUB BORING MACHINE.—William Snodgrass (assignor to himself and James Statler), Macomb, Ill.

1st, I claim the laterally-adjustable frame, having the chucks, V Q, mounted therein, in combination with the cutting and feeding mechanism, arranged to operate as and for the purpose set forth.

2d, The cutter bar, H, pivoted upon the front end of the carriage, C, in combination with the screw rod, E, mounted on the carriage, and arranged to operate the cutter bar, as described.

3d, The strap, m, or its equivalent, arranged to unite the independent chucks, V and Q, for the purpose of causing both to revolve together when motion is applied to one, substantially as herein set forth.

4th, Keeping the cutter bar to its work by means of the screw thread, Q', on the chuck, Q, wheel, S', mounted on the shaft, S, and cord, u, attached to the carriage, C, when said parts are arranged to operate as herein shown and described.

66,406.—MEASURING FAUCET.—Dwight S. Spafford and Geo. Elsey, Morrison, Ill.

1st, I claim the fixed and revolving barrels, B1 B2, of a faucet, when the latter is so connected with the beam of a scale, that when the beam rises, it shall disengage a catch, and the faucet be caused to close automatically by mechanism, substantially as set forth.

2d, The combination of the beam, G, platform, H, lever, F, flange, D, lever, E, and faucet, B, with barrels, B' and B'', substantially as described.

3d, A scale beam, G, and faucet, B, so arranged that the pivot of the beam shall have their bearings on flanges formed on the faucet, and the beam and faucet shall be so connected by intermediate mechanism that the rising of the beam shall cause the faucet to be closed automatically, all substantially as described.

65,407.—MANUFACTURE OF BRICKS.—Samuel B. Spaulding, Brandon, Vt.

I claim the composition for the paste and the manner of its application for the purposes herein set forth.

66,408.—BRICK MACHINE.—A. J. Sprague (assignor to himself and Paul Jones), Toledo, Ohio.

1st, I claim the rotary presser, G, arranged within the press box, F, to operate in the manner substantially as and for the purpose set forth

2d, The gratings, E, placed over the opening, b, in the bottom of the mud-mill, B, substantially as and for the purpose specified.

3d, Operating the mold-feeding plate, U, through the medium of the revolving arms, Z Z, on the shaft, H, the uprights, Y, on the bars, W W, and the spring, A', or its equivalent, all arranged substantially as shown and described.

66,409.—WOOD-BENDING MACHINE.—Otis W. Stearns, Lebanon, N. H.

1st, I claim the connected presses, b and b', with their heads, d and d' e and e', arranged as described and operated upon by cams, B, or their equivalents, so as to be moved in concert for receiving a straight stick between them, and bending it into shape for a scythe snath, substantially as herein described.

2d, The sliding frame, E, with vertical followers, n, constructed and arranged substantially as and for the purposes herein specified.

3d, The double clamp, F, in combination with the iron mold r, arranged and operating substantially as and for the purposes herein set forth.

4th, The combination of the cams, B, the presses, b b', the followers, n, and the lever clamps, D, constructed arranged and operating in the manner and for the purposes herein described.

66,410.—BED BOTTOM.—William Stenger and Aloys Beyrnheimer, Jefferson, Ohio.

We claim the loops, a a, bands, t t, and wedges, x x, when used upon the bedstead frame, in combination with the cords, z and y, in the manner substantially as and for the purposes set forth.

66,411.—MACHINE FOR FORMING SHEET METAL PANS.—Benjamin D. Stevens, Decorah, Iowa, assignor to himself and Charles Gill, Exeter, N. H.

I claim the combination and arrangement of the bed piece, B, and the clamp bar, A, and forming bar, C, hinged to said bed piece on opposite sides thereof, substantially as and for the purpose herein specified.

I also claim hinging separate clamp bars, A and F, to the same bed piece, B, for forming sides of different lengths, as herein set forth.

I also claim the gage pins, c c, applied in combination with the grooved clamp bars, A, for the purpose specified.

66,412.—HAY RAKER AND LOADER.—George W. Swartz, Newburgh, Pa.

1st, I claim the coupling or staple, C, and keys, C', for attaching the loader to a wagon, substantially as described.

2d, I claim the looped and curved double rake teeth, H, in combination with the guide, A2, and the drum, E, substantially as and for the purpose described.

3d, I claim the rope or cord, L, for attaching the rake teeth, H, to their adjusting rod, K, as and for the purpose specified.

66,413.—BUTTONHOLE FOR CARRIAGES.—S. C. Talcott, Ashtabula, Ohio.

I claim, 1st, The washer, A, provided with the arms, E, disk, B, and serrated washer, C, arranged in the manner and for the purpose substantially as set forth.

2d, A washer, Fig. 3, in combination with the disk, B, substantially as described and applied to the purpose set forth.

3d, The serrated washer, C, in combination with the disk B, when applied to the purpose in the manner specified.

66,414.—MACHINE FOR MAKING HOT-PRESSED NUTS.—Lewis Thierry and George B. Hill, Detroit, Mich.

I claim the combination of the die, clamps, cutter slides, hollow plungers, and center punch, or equivalents, constructed and arranged substantially as described.

66,415.—BEEHIVE.—John Hopkins Thomas, Rochester, N. Y.

I claim, 1st, The use of the beveled bearings, d d d, in combination with the upright projecting stops, a a a, constructed in the manner and for the purpose herein set forth.

2d, The use of the back entrance in combination with the sliding gage for the purpose herein set forth.

66,416.—CHURNING APPARATUS.—J. Thompson, Hartville, O.

I claim the use of the double crank shaft Q, in combination with the connecting rods R and S, and the working beams, D and E, when said crank shaft is operated by wheel work, cord and weight, in the manner and for the purpose specified.

66,417.—DEVICE FOR TETHERING ANIMALS.—J. P. Thorp, Southington, Conn.

I claim the frame, B, fitted on the stake, A, so that it may turn loosely thereon, in combination with the shaft, C, fitted in the upper part of said frame, and having the reel, D, upon it, with halter rope, G, attached, the shaft, C, also having the ropes, E E, applied, with weight, F F, at their ends, and all arranged substantially in the manner as and for the purpose set forth.

66,418.—CAR COUPLING.—Daniel J. Tittle, Albany, N. Y., assignor to Abbie M. Tittle.

1st, I claim the lever, e, fulcrum, f, and the rod or chain, g, or both, in combination with the rack wheel shaft, s, as and for the purpose described.

2d, I claim the lever, e, the rack, h', and the rack, i, in combination with the shifting bar, k, for the purpose set forth and described.

3d, I claim the hinged draft bar, a a, in combination with the lever, e, fulcrum, f, rod or chain, g, or both, operated by the lever, h, or rack wheel shaft, s, as and for the purposes described.

4th, I claim the hook head covering perforated as described, in combination with the clevis, O, or its equivalent, as and for the purpose set forth and described.

66,219.—SAFETY BRIDGE FOR RAILROAD CARS.—Lester Traxler, Butler, Ohio.

I claim forming a passage way between the cars of a train by means of the wings, B, boxes, D, and adjusting block and screw, E F, the parts constructed and arranged substantially as herein shown and described for the purpose set forth.

66,420.—EXTENSION FRUIT LADDER.—John E. Treat, Oxford, Mich.

I claim the hinged brace, C, when arranged with the pieces, a a, and steps, A, journaled thereto, in the manner and for the purpose herein specified.

66,421.—GATE.—Cornelius Trexler, La Grange, Ind.

I claim the combination and arrangement of the gates, B and E, constructed as described, gate posts, A and B, bars, a1 and b1, pullies, C1 C2, and projecting bar, e3, with each other, substantially in the manner herein shown and described and for the purpose set forth.

66,422.—ROCK-DRILLING MACHINE.—Edward M. Troth, New York City.

I claim, 1st, The combination, in the one machine, of separate engines for independent action of a combined drill holder and ram, substantially as specified.

2d, The combination of the sliding box, L, rotating tube, J, and ram or drill holder, M, for operation together as herein set forth.

3d, The cushions, h, when applied at or near opposite ends of the sliding box, L, substantially as specified.

4th, The combination of the wheel, K, tube, J, and piston rod, I, provided with a coupling, a, for operation together, as herein set forth.

5th, The combination with the sliding box, L, of the screw, S, screw box, R, and clutch box or frame, Q, or other equivalent gear, whereby the feed of the drills is established, a short picking action given to the same or a distinct ramming stroke or action produced, essentially as specified.

6th, The application to the frames, A and B, of the eccentrics, V, substantially as and for the purposes described.

66,423.—GATES.—Hiram Turner, Ripon, Wis.

I claim the combination of the hinged part or crane, B, and adjustable part, C, with each other, said parts being constructed and arranged substantially in the manner herein shown and described.

66,424.—BAG HOLDERS.—Lafayette Turner, Cedar Rapids, Ia.

I claim an adjustable folding and gathering bag holder having its frame so connected by bars hung upon pivots as to enable its sides to lie upon each other when closed, and furnished on one side with an adjustable hinged cross piece or bar to stretch the frame, substantially as shown and described.

66,425.—EXCAVATOR OR DIGGING MACHINE.—F. J. Vandenwinne, Brussels, Belgium,

I claim, 1st, the general arrangement and construction of an excavating or digging machine, as hereinbefore described and represented in the accompanying drawings.

2d, The peculiar arrangement and construction of the picks in combination with the endless chain carrying the troughs, and mechanism for working the same, as hereinbefore described and represented in the accompanying drawings

66,426.—DRAY.—Francis Van Doren, Adrian, Mich.

I claim, 1st, the platform, E, when provided with rollers, F, in the manner set forth, in combination with the dray frame, A, substantially as and for the purpose herein shown and described.

2d, Having rollers, F, F, arranged on the surface of a dray, for the purpose of facilitating the loading and unloading of the same, substantially as set forth.

3d, A dray when so made that its platform or bearing portion is made in shape of a detachable skid, substantially as set forth.

66,427.—CIDER MILLS.—T. Van Kannel, Cincinnati, Ohio.

I claim providing the cones or beveled disks, I, I', with a series of concentric circles of teeth meshing or gearing into a corresponding series of cavities upon each, as herein set forth for the purpose specified.

66,428.—DRYING AND PREPARING PEAT.—T. G. Walker, New York, N. Y.

I claim subjecting peat and other substances, when confined in a close retort, to a high degree of heat or to any requisite temperature, and then operating a communication between the retort and another vessel, the interior of which other vessel being either under a lower pressure than the retort or a vacuum, and from such vessels allowing the vapors and volatile portions to escape, substantially as described.

66,429.—MACHINE FOR MAKING PAPER COLLARS.—Wm. H. Walton, Brooklyn, N. Y.

1st, In combination with the cylinders, e and f, I claim the curved knife, g, the straight knife, h, and the spring, g', all constructed, arranged and operating substantially as described.

2d, I claim the folding conductor, m, constructed, arranged in the machine, and operating substantially as described.

3d, I also claim in combination, the rollers, e, f, provided with forming and severing knives, g, h, and suitable devices for embossing or stamping the folding conductor and forming rollers, all constructed and arranged, substantially as described, and so geared as to make and finish collars by one continuous, rotating, progressive movement of machinery, forming a collar at each revolution of the said cylinders, e and f.

66,430.—CONNECTIONS FOR HARVESTERS.—H. L. Wanzer, Clyde, Ohio.

I claim the pin, l, in combination with the packing, k, all made and operating substantially as and for the purpose herein shown and described.

66,431.—HOLDER FOR BROOMS.—H. W. Warner, Watertown, Conn.

I claim the improved holder herein described, the same consisting of the plate, B, or its equivalent, and arms, C C, hung therein and arranged substantially as and for the purpose described.

66,432.—COMPOSITION FOR TANNING.—Abram Westbrook and Justin Campbell, Leona, Pa.

We claim, 1st, the application of licorice for tanning purposes, for the purpose set forth.

2d, The composition for tanning leather when the same is compounded of the ingredients in about the proportions set forth.

66,433.—IRON BRIDGES.—T. B. White, New Brighton, Pa.

I claim a tubular iron beam, consisting of the upper plate, a, with the external flange, e, the side plates, b, provided at their lower edges with similar flanges, e, and the lower plate, c, all constructed and united as described.

66,434.—ATTACHING TOOLS TO THEIR HANDLES.—L. P. Wilcox, Brooklyn, N. Y.

I claim the wood stock or handle, A, constructed with its one end, a, tapering and slotted longitudinally as at c, in combination with the tapering, sliding ferrule, B, substantially as and for the purpose set forth.

66,435.—MODE OF PREVENTING CORROSION AT THE JOINTS OF STEAM BOILER FLUES.—Parker Wineman, Minooka, Ill.

I claim a boiler tube or flue having its end or ends coated or covered with a metal, which is less corrodible than the metal of which the tube or flue is made, substantially as described.

66,436.—PUNCH.—Lorenz Wolf, St. Jacob, Ill.

I claim the grooved cap, D, curved and grooved standard, B, screws, b, b, and springs, d, d, in combination with the punch and die, all as set forth.

66,437.—RAILWAY CHAIR.—J. E. Wootten, assignor to himself, C. E. Byer, and W. Wharton, Jr.

I claim the rolled bar, B, with its under rib, b, side rib, e, and bent flange, d, when the said ribs are constructed and arranged as described.

66,438.—STEAM GENERATOR.—Wm. Young, Easton, Pa.

I claim the water heater, D, arranged with reference to the fire box, B, the flue, G, and the steam chamber, C, for the purpose set forth.

66,439.—MACHINE FOR FURROWING MILL STONES.—J. J. Zinn, Albion Pa.

I claim, 1st, the vibrating bar, c, and the guide bar, b, combined with the bed plate, A, substantially as and for the purpose herein described.

2d, The pick handle, d, with the taper socket, g, in combination with the nut, e, and the hollow end of the arm, c, constructed and operating substantially as and for the purposes described.

REISSUES.

2,664.—HARVESTER.—Harvey L. Hopkins, Eaton, N. Y. Patented Dec. 17, 1861.

1st, I claim combining with the frame of a harvester a finger bar which may be turned horizontally upon its pivoted connection, from one side of the frame to the opposite side, substantially as described.

2d, Combining with said finger bar and elevating and supporting apparatus, so arranged as to perform the same service whether the finger bar projects to the right or left of the main frame, substantially as represented and described.

3d, A reversible pole or tongue for the purpose of drawing the machine in either direction, substantially as described.

4th, A driver's seat which may be reversed to accommodate the operator, substantially as and for the purpose set forth.

2,665.—MANUFACTURE OF PAPER PULP.—J. B. Palser and Gardner Howland, Fort Edward, N. Y. Patented Nov. 22, 1859.

We claim the boiling of straw or other paper stock in a caustic alkaline solution of any desirable strength, according to the refractory character of the stock being treated, at a temperature indicated by an internal pressure due to heat, making 110 pounds to 130 pounds pressure to the square inch, substantially in the manner and for the purpose described.

2,666.—SWELL FOR MELODEONS.—G. A. Prince, C. E. Bacon and C. F. S. Thomas, Buffalo, N. Y., assignees by mesne assignments of Thomas F. Thornton. Patented May 22, 1855.

We claim so constructing and operating the swell valve of melodeons and other reed musical instruments that a part of the valve may be opened in a manner to uncover and permit a free escape of the sound from only a part of the notes, while other portions of the notes remain covered by other portions of the valve, for the purposes and substantially as described.

2,667.—FARM GATE.—A. C. Teel, Girard, Ill. Pat. Dec. 1, 1863.

1st, I claim the hanging or suspending of a gate in such a manner that it will have a combined and swinging movement in the opening and closing of the same, the gate sliding from a closed position or state to a central balanced state and then swinging while in a state or equipoise to an open position and closing from an open position by swinging around in line with the gate posts and sliding to a closed state, substantially as shown and described.

2d, I claim the placing of the gate posts, C' D C' D', in such a relative position with each other and constructing and hanging the gate between them to admit of the opening and closing of the gate, substantially as herein set forth.

2,668.—SHEET-METAL BEAM.—Richard Montgomery, New York City. Patented July 12, 1853.

I claim a beam formed of sheet metal bent into a series of longitudinal folds the sides of which are flat and parallel and the tops and bottoms uninverted and inverted arches respectively.

I also claim the combination with such beam of a pair of saddles to support its ends, substantially as herein set forth.

DESIGNS.

2,690.—KNITTED FABRIC.—F. Bleckle, Philadelphia, Pa.

2,691.—BLIND BINDING.—H. A. Oesterle and Co., (assignor to Stephen Hascubuhler), Philadelphia, Pa.

2,692.—FLOOR CLOTH PATTERN.—James Paterson, Elizabeth, N. J., assignor to Edward Harvey, Brooklyn, N. Y.

2,693.—METALLIC BAND FOR RAILROAD CAR SEATS, ETC.—D. F. Randall, Chicopee, Mass.

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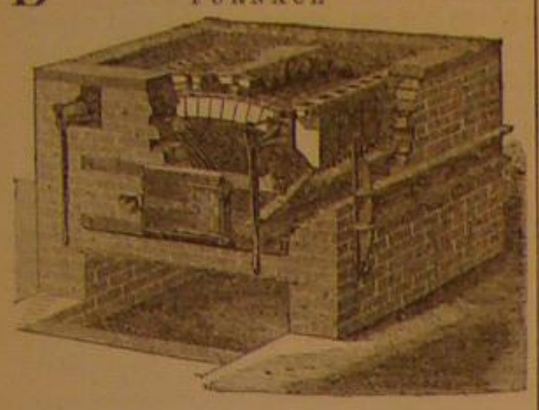
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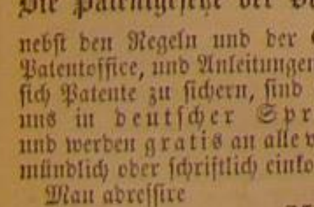
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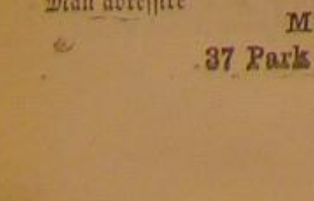
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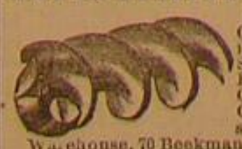
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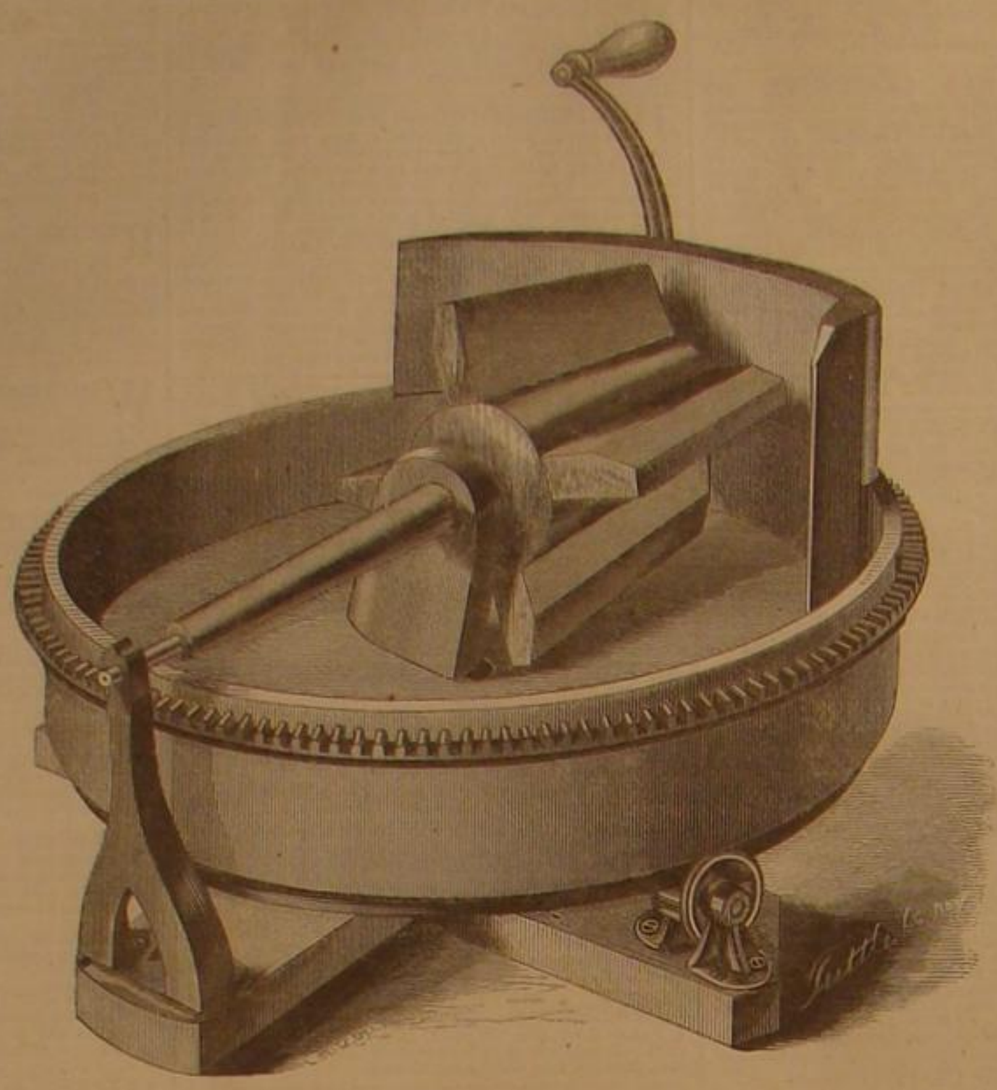
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The blades of the dasher are so formed as to fit the convex surface of the tub bottom, and their rotation, as the butter is carried around, presents the butter at a differing angle to their action at each revolution, thus effectually exposing every portion of the butter successively to their operation. In this is one of the main advantages of this worker. A central guide and a guard and scraper on the crank side continually return the butter to the action of the dasher or breaker, while the buttermilk and the aqueous particles find their way down the incline of the bottom to the center, where there is an aperture through which they escape.



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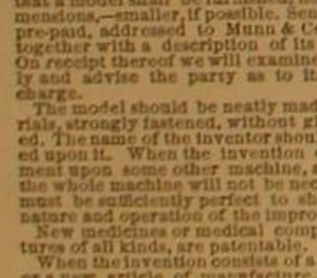
Bridging the British Channel.

A French engineer has made a plan for a bridge which is greatly praised by the Paris *Moniteur*, broad enough to hold a double line of railway, a carriage road and a path for foot passengers. There would also be space for a row of shops along this Dover and Calais road which, once established, would, no doubt, become a very popular thoroughfare; and half way across there would be a restaurant. The bridge would rest on a series of thirty-two vertical, rectangular iron piles, each pile to be about 670 feet high and 335 feet broad. The depth of the channel between the two points named is found to be not over 135 feet, so that the bridge would be about 535 feet above the sea level. The journal quoted continues that in building the bridge the first step taken would be to connect the iron piles by means of sixteen cables of plaited wire, stretched in parallel lines from Shakspeare's Cliff, on the English side of the channel, to Cape Blanc Nez, on the French side, a distance of about twenty miles. The body of the bridge would thus be formed of iron tresses stretched from pile to pile. The iron piles would not be nice things for a vessel to run against; but they would be of great value as lighthouses, and accordingly each pile would be fitted with a signal light. The cost of the bridge is estimated at $80,000,000.

A New Source of Alcohol and Illuminating Gas.

Mr. Mosheimer, of this city, has shown us a letter received by last steamer, from Baron Rittinger, Chief of the Austrian Imperial Mining Schools, etc., in which, among other matters, he communicates the fact that a company of scientific men, in the interest of certain capitalists, have recently been inquiring carefully into the best mode of utilizing the waste products of coal oil refineries and distilleries. The result has been a successful and economical plan for obtaining alcohol from the oil waste, and a very superior illuminating gas from distillery waste. The gaseous product of the latter is said to have four times the illuminating power derivable from coal gas, and can be produced cheaper; while alcohol can be produced so cheaply from the residue of the oil refining, that it is thought it must work a complete revolution in the production of that article. A large company was being formed to introduce both these branches of manufacture throughout the Empire.—*San Francisco Press.*

PATENTS



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SCIENTIFIC AMERICAN

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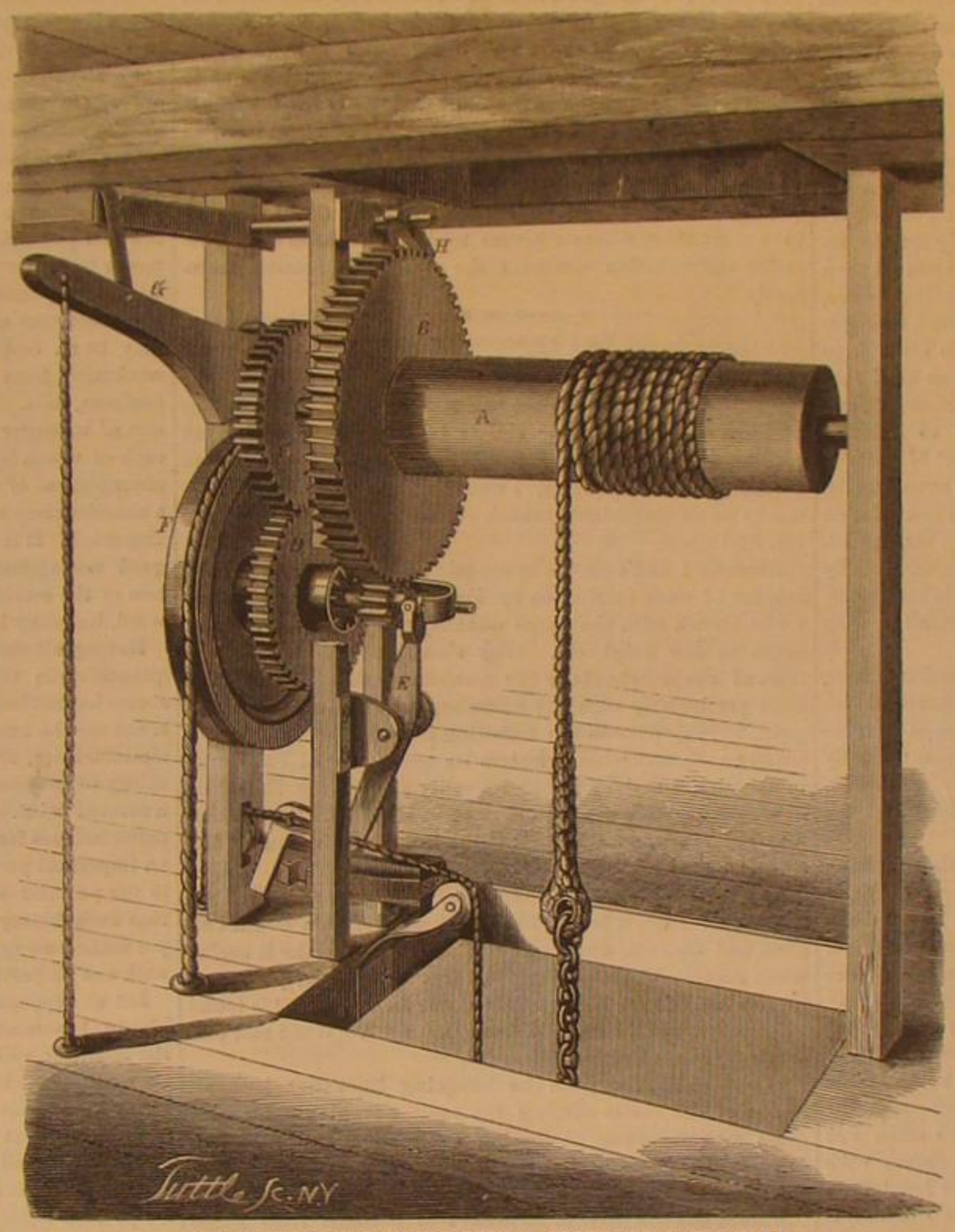
Vol. XVII.—No. 4. [NEW SERIES.] NEW YORK, JULY 27, 1867. $3 per Annum [IN ADVANCE.]

Hoisting Wheels for Warehouses, Etc.

The engraving represents the best hoisting wheel, we think, that has yet come under our observation. One of the annoyances of the ordinary hoist is that whatever the load to be raised, the speed is always the same, whereas a light load ought to be hoisted not only with less effort than a heavy weight but much more rapidly. This is what this hoisting apparatus does.

The beam, A, has secured to its shaft and moving with it, a large gear wheel, B, and a smaller gear wheel, C. This latter gears into the wheel, D, of the same number of teeth, which is loose on its shaft. Its hub is a gear with internal teeth, into which a pinion on the same shaft slides by means of the lever, E, working a clutch. The pinion is secured to the shaft by means of a feather and slot, as are ordinary clutches, so that while it can be slipped forward and back, in either position, its rotation secures the rotation of the shaft on which it works. It engages either with the large wheel, B, or with the smaller gear, D, according as the clutch is moved in one direction or another, or it may be held between the two, when the hoisting wheel, F, may be turned without moving any part of the machinery except the shaft on which it is fixed.

When, as in the engraving, the pinion gears with the large wheel, B, it is evident that by working the wheel, F, by the hoisting rope, an immense leverage is obtained and the speed of the barrel, A, will be slow. This is the position for raising heavy weights. But when the weight to be raised is light, the pinion is shipped into the hub of D and locks that wheel to the shaft. Now, if power is applied to the hoisting rope, the barrel, A, will turn as fast as the wheel, F, because the size of the gears on either shaft is the same. It will thus be seen that articles of light weight may be raised with great rapidity, while a shifting of the clutch will instantly throw the machinery into gear for heavy work. As will be seen. this shifting is readily managed from any floor by means of the lines attached to the lever, E. The edges of the teeth of the wheel, B, the pinion, and the internal gear of D are brought to a V-edge to insure locking whenever the pinion is shipped. G is a brake and unlocking lever, by means of which a load can be lowered. By pulling upon the line attached to it, the pawl, H, is lifted and the wheel, B, with the barrel, A, allowed to turn, while the velocity of their revolution may be regulated by the brake.



McMURTRY'S IMPROVED HOISTING WHEEL.

This hoisting apparatus has been in use for over seven years and has received the highest testimonials from those who have used it. It was patented by John McMurtry and is manufactured by S. H. Whitaker, 162 East Front street, Cincinnati, Ohio. For information relating to the invention, address John McMurtry, Lexington, Ky.

Improved Reamer.

The most expensive of the smaller tools used in machine shops is the reamer,and in a well managed shop no tools are so indispensable as a good set of standard sizes of reamers, enabling the workmen to keep a perfect uniformity of sizes of holes in the building of a number of machines of the same kind, and in various other uses where a similarity is required. Owing to this great expense, few shops are provided with them, above the smaller sizes, although just as much time might be saved by their use as in the smaller ones.

The engravings represent an article of manufacture which, at a trifling expense, will enable all shops to provide themselves with any sizes necessary for their work. It is a reamer made entirely of cast iron, excepting the cutters and shank,which are of steel. The manner of making them is simply this:—The steel for the cutters is cut off the required length and made dovetailing as represented in Fig. 2, or as the ordinary dovetail, which can be done in rolling the steel in bars, where a large number are made, placed in the mold, as is the shank, and the iron is allowed to flow through the mold uniting the steel and iron so firmly together that it is impossible to separate them. They are then turned off to nearly the size required, hardened, and again placed on centers and ground off to the size required. These reamers can be made any size, shape, or number of cutters desired, at a trifling expense over the price of common castings. They answer admirably for taper reamers for reaming large steam, gas, or water cocks, or for boring pullies by machinery, etc. The cast iron gives a firmness to the cutter which can not be obtained by simply using a cutter for the purpose of boring. They have been in use in a number of shops, made in a variety of shapes for different work, always giving good satisfaction.

Fig. 1.

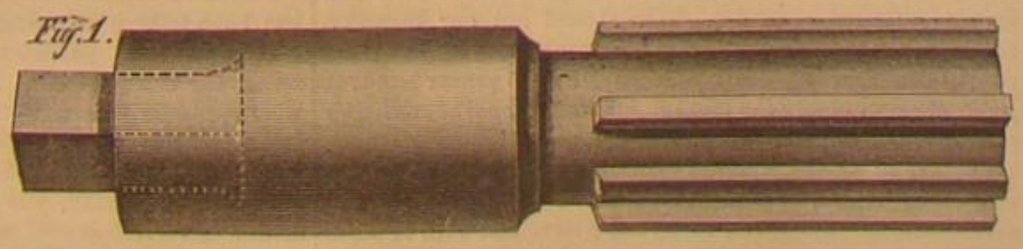


Fig. 2.



BURLINGAME'S REAMER.

This reamer was patented by W. Burlingame, Choate Mfg. Co., Exeter, N. H., through the Scientific American Patent Agency, Jan. 1, 1867. The patentee wishes to dispose of the entire right to manufacture them, and will furnish companies with samples at a reasonable price. State or shop rights for sale. For further information address as above.

ARTIFICIAL STONE FOR BUILDINGS.

For a number of years a Mr. Ransome of England has been experimenting in the manufacture of artificial building stone. From time to time an account has been published in these columns of his progress. In their issue of the 28th of June the *Engineering* gives the annexed interesting statement of the mode of manufacture, test of processes, etc. :—

If Mr. Ransome has not found the philosopher's stone, he has at least produced a stone worthy a philosopher, and which promises to become the stone of the ages. For it appears to have the elements of great durability, and it certainly possesses every other quality desirable in building stone, whether for structure or ornament. Although five years are not five centuries, chemistry has analyzed even the tooth of time, and can produce, within the period of a comparatively brief experiment, results identical with those of ages of atmospheric corrosion and disintegration. Mr. Ransome's stone has been boiled, and roasted, and frozen, and pickled in acids, and fumigated with foul gases, with no more effect than if it had been a boulder of granite or a chip of the blarney stone. It has been boiled and then immediately placed on ice, so as to freeze whatever water might have been absorbed, and it has been also roasted to redness, and then plunged in ice water, but without any sign of cracking or softening, superficially or otherwise. Nor does its durability rest alone upon such evidence as this, for it is of the simplest chemical composition; and chemistry and geology alike testify to the durability, if not the indestructibility, of a stone which is nearly all silica, like flint, and onyx, and agate, and jasper. It has no oxydizable constituent; for silica, or silicic acid, is already oxydized, and thus it is unalterable in air: and as the new stone is almost impermeable, it will suffer little, if any, injury from moisture or frost. We may, then, as the lawyers say, "admit" the durability—and if we insist upon further evidence, only posterity, say in the twentieth and twenty first centuries—can have the benefit of it, and no doubt Mr. Ransome will bequeath plenty of test blocks for their satisfaction—and the stone is everything else that can be desired of a building stone, or of a stone for external ornament, excepting, of course, that it does not polish.

And how marvellous, for its simplicity and beauty, is the process by which this stone is made! Some toiling mason or other, hewing in the quarry or in the builder's yard, must have wished, before now, that stone, like iron, might be melted, and run in molds, even though his own occupation were thus at an end. Did he ever, when by the sea shore or by a sand pit, think of cementing indissolubly together the countless millions of grains into solid rock? Mr. Ransome, no mason, however, unless he be, as he may be for any thingwe know, a member of the mystic brotherhood, did think of this. And he tried every cement he could lay his hands to, and did not succeed. The sand became little else than mortar by such sticking as he could effect. But he found out, at last —and we are speaking of a time more than twenty years ago —that the best sandstones were held together by silicate of lime. And so he set himself to work to produce this substance, indirectly, from flints, of which plenty could be found for the purpose. But the flints had to be liquefied first, and how could this be done? Not by heat, nor would caustic soda touch them, so the chemists said. Flints might be boiled in a caustic solution for a week together, so long as the boiler was an open one, and lose very little by the operation. But by-and-by, Frederick Ransome made one of the most unexpected discoveries in chemistry, viz., that when boiled in a caustic solution, under pressure, flints would melt almost like tallow before the fire. But we are not about to give the long history of the invention. With flint soup, or silicate of soda as a liquid, the question was what other liquid would, in mixing with it, turn both into an enduring solid? What other liquid would turn both into silicate of lime—the substance he was seeking? When he found that chloride of calcium (in solution) would, when mixed with silicate of soda, turn both into flint, or something very much like it, the road was clear, and the manufacture of stone from sand was as simple and as beautiful a process as the making of Bessemer steel from pig iron by blowing air through it when in the melted state. Chloride of calcium had been chemically considered a very respectable married couple, known as Ca and Cl. There was a little bigamy attaching to silicate of soda, but the principal parties to the marriage were silicium and natrium, or Si and Na. But, as has happened before now with organic bodies, these inorganic couples, on their introduction to each other, at once ran away with each other's husbands and wives. Si, although still keeping his wife O, took Ca and became silicate of lime, while Cl and Na were, like Lot's wife, turned into salt, or chloride of sodium, for their wickedness.

The sand, a clean-grained, slightly brownish sort, just such as a dishonest grocer might select for increasing the gravity specific or otherwise, of his sugar, comes from near Maidstone. There is no end to the quantity of it, and we believe it costs less than 5s. a tun in the Thames. There are flints, enough for a hundred years to come, brought up from the chalk pits at Charlton; and the caustic soda and the chlorine of calcium, the latter a waste product of the soda manufacture, are bought of the wholesale chemists. The silicate of soda is made from the flints and caustic soda as follows: The flints are heaped upon iron gratings within a series of cylindrical digesters, of the material, size, and form, of small steam boilers. A solution of caustic soda is then added; the digester is then closed steam tight, and the contents are boiled by steam of 70 lb., taken from a neighboring boiler, and led through the solution in a coil of iron pipes. The solution of caustic soda is prepared of a specific gravity of about 1,200.° The flints are dissolved into "soluble glass," and are drawn off in that state, as a clear though imperfectly liquid substance, which is afterward evaporated to a treacly consistency and color, and of a specific gravity of 1,700.°

The sand is completely dried, at the rate of two tuns an hour, within a revolving cylinder, through which hot air is forced by a centrifugal fan. A small portion of finely ground carbonate of lime, say Kentish rag, or even chalk, is mixed with the sand, the more closely to fill the interstices; and each bushel of the mixture is then worked up in a loam mill, along with a gallon of the silicate of soda. Thoroughly mixed with this substance, the sand has a sticky coherence, sufficient to enable it to be molded to any form, and, when well rammed, to retain its shape, if very carefully handled. In this condition—molded, of course, and any thing that can be done in founder's loam may be done in this sand, sticky with silicate of soda—in this condition it is ready for the solution of chloride of calcium. The instant this is poured upon the molded sand, induration commences. In a minute or so, we hardened little lumps of sand, so slightly stuck together by the silicate of soda that we could hardly keep them from falling to pieces within the fingers, into pebbles so hard that they might be thrown against a wall without breaking, and only a short further saturation was necessary to indurate them throughout. In other words, on the instant of contact, the silicate of soda and the chloride of calcium mutually decompose each other, and reunite as silicate of lime and chloride of sodium, the former practically indestructible in air, the latter, common salt, perfectly deliquescent and removable by washing, although the stone, after the washing, is impermeable to water. Plaster of paris does not set quicker than silicate of soda and chloride of calcium.

The chloric solution is first ladled upon the molded sand, and, the hardening going on, the objects are afterward immersed in the solution itself, wherein large pieces are left for several hours, the solution being boiled in the open tanks by steam led through it in pipes. This expels any air which may have lodged in the stone, and possibly hightens the energy of union with the silicate.

After this the stone is placed, for a longer or shorter time, according to the size of the object, under a shower bath of cold water. This is not, by bathing, to convert it into Bath stone, although were the Bath stone a sandstone, instead of an oolitic formation, this name would do as well as any. The salt, or chloride of sodium, deposited throughout the interstices, is sought out and washed away, in brine, by the water, and were it not that a portion of undecomposed chloride of calcium was also washed out, this brine might be profitably evaporated for common salt. Now this searching out of the salt by the water would appear to prove that the stone was perfectly permeable, but, by one of those paradoxes with which chemistry abounds, the stone, when once freed from salt, is almost impermeable. The action is one which, if it can be explained at all, can only be explained as one of the phenomena of dialysis, as experimentally investigated by Professor Graham. There is no doubt whatever that salt has been deposited everywhere throughout the stone, no doubt that is is afterward completely washed out, and yet the stone as effectually resists the passage of water afterward as if it were granite or marble.

It is not necessary to describe the variety of objects that may be made in the new stone. It is practically a fictile manufacture, although not indurated by fire, and, unlike fictile goods, having no shrinkage or alteration of color in the making. Whatever the required size of the finished stone it is molded exactly to that size, with no allowance as in molding fire-clay goods or in pattern making for castings in iron. The heaviest blocks for works of stability, and the most elaborately ornamented capitals, tracery, or copies of statuary may be made with almost equal facility. For any purpose for which natural stone has ever been used for construction or architectural ornament, the artificial stone will fitly take its place. Mr. Fowler has used it extensively in the stations of the Metropolitan Railway; Messrs. Lucas Brothers have used it with success in various works; several manufacturers at Ipswich and elsewhere have the bed stones of their steam engines, steam hammers, oil mills, etc., formed of the new stone. Mr. Ransome has molded a large number of Ionic capitals for the New Zealand post office, and still more richly embellished capitals, modeled from those of the Erectheum at Athens, for public buildings at Calcutta, beside a great amount of decorative work for English architects.—*Engineering.*

Novel Lifeboat.

There is now in process of construction at the yard of G. W. Alexander, in Philadelphia, a lifeboat of the ordinary form with detaching apparatus, and a peculiarity which was wanting in all the boats exhibited before the Commissioners. However successful each of them promised to be in keeping afloat in the most troubled sea, not one of them in any way insured its passengers from being washed away or submerged by a sea breaking on or over. This last desideratum, and not the least important one, this novel invention claims to supply. The boat proper is arched over by a light metal skeleton ribwork stretching from gunwale to gunwale, and there secured. Upon this frame work is extended a double covering composed of canvas and india-rubber, firmly secured to the boat. The double covering is capable of inflation, and thus renders the entire structure extremely buoyant. An opening in the cover, three feet by four, admits the passengers. This opening is around the mast, and by a peculiar arrangement can be hermetically closed when passengers and crew have entered. The mast, which is of metal and hollow, is used as a ventilator, and in conjunction with a small fan of simple construction and easy operation, serves as the means of producing two currents of air—one of foul air generated in the boat when tenanted, and another of pure air to take its place.

It is claimed for this boat that when completed, it can be prepared for launching as rapidly as any other; that owing to its not careening when weighed upon on either side, passengers will enter with safety; that it is certain to fall with its load as it ought to do from the davits, and that when on the sea, however tempestuous, it will be impossible to swamp it, being water-proof above and below. It is to be propelled by oars, passed out through apertures, so constructed as to admit of no leakage, and an arrangement in the cover permits a look-out to the steersman. This novel boat, in which, if practice will bear out theory, passengers can be rescued from shipwreck and sustained through the worst weather for many days, will undergo a test down the bay in a short time, where a severe trial will be made of the peculiar and valuable qualities she claims to possess exclusively.

For the Scientific American.

FLINT GLASS MANUFACTURE.

Knowing the deep interest you take in the manufacturing business and the working classes in general and with what readiness you receive in your columns anything tending to ameliorate their position, I would submit to you a few remarks on an important branch of our national manufacture viz. flint glass.

Recently I had occasion to consult a document showing the amount of trade carried on by France with Chili and Brazil. I was struck with the large quantity of glass that country sends to our neighbors. Why should it be so? Is it the fault of our merchants or our manufacturers? The fault is more particularly with our manufacturers and we will try to prove our assertion in the following lines:

Let us see first what resources we possess. We have sand in abundance and of the first quality such as the Berkshire in Massachusetts and St. Genevieve in Missouri. Sand is also found in Virginia fully equal to the Berkshire, in South Carolina, Georgia, Alabama etc.

As to fire clay, besides the superior quality found in Cheltenham in Missouri, it is found in Kentucky, Virginia, South Carolina and Georgia, awaiting skillful hands to make it useful, when manufacturers will get so far over their prejudices as to give it a fair trial. Potash is at our door and lead is found in abundance in Missouri, Illinois, Iowa, etc. Wood and coal is plenty in several localities.

It will be noticed from the foregoing lines that Missouri is one of the states offering the most advantages for flint glass manufacturing, containing every material needed and in sufficient quantity to furnish glass to the United States, for centuries to come.

France has but little or no lead, it is brought from Spain and England: Potash is sent from this country: Sand is scarce and of inferior quality compared with that found in this country: Fire clay is dear as well as coal and wood.

What is there wanting to enable manufacturers here to compete with the French in supplying markets at our door? If we consult manufacturers they will say that labor is much higher here than in Europe; this is true, but nature has given us advantages that more than offset this difference.

The fault in our opinion is to be found somewhere else. First our wares are as a general thing too heavy and clumsy: moreover they are not in accordance with the taste of other countries, such as Brazil, Chili etc., where light and tasty wares richly cut are better appreciated. Our wares necessitate a large quantity of glass, fully double of what would be required in France for the same purpose. It is established here beyond a doubt that French manufacturers have kept their superiority in this style of wares, and know how to take advantage of it by having styles adapted to the taste and uses of different countries. Why should not our manufacturers do the same? Workmen here are not inferior to those of Europe, they are only waiting for the proper hands to guide them to obtain the same result, and moreover our heavy clumsy wares are an imposition and a tax on our consumers who have to pay for a large quantity of materials of no use to them whatever, this however yielded no larger profit to manufacturer. What can we do but grieve and bear it when we have no choice and a prohibitory tariff is now in force to protect a branch of manufacture in existence in this country for a number of years. In consequence, manufacturers are nearly entirely indifferent in adopting means to improve their business.

The principal fault is in the management: our want of system and control in order to remedy abuses, and in a word, in a wrong application of the productive forces.

In France the management is always entrusted to the hands of a superintendent capable of managing every branch of the factory, and under his immediate orders are placed the subaltern employés. It is indispensible for him to know every particular in manufacturing, from the buying of the materials up to the sale of the wares. It is evident that no one better than himself is able to establish cost prices. It is well to note here that the cost price of an article is of more importance than the price of sale, as competition can only be overcome by reducing the former. Cost price therefore, is the thermometer of the manufacturer; it shows him whether he is able to maintain competition, shows him the reasonable limit to which it ought to go; it is by its agency that an approaching failure in business is foretold.

French workmen in glass manufactories are paid as follows.—They have stated wages, varying according to the intellectual capacity and skill of each, but the cost price, of each article is ascertained before hand from an average taken of the quantity made by each set of hands, and if subsequently the amount of work performed exceeds in value the amount of wages paid, the amount of this excess is distributed among each set of hands according to a certain pro rata, in the shape of extra compensation, thus stimulating the workmen to do their best for their own interest and that of their employer; for this reason they would not suffer the management to remain in the hands of incompetent parties who would be impediments in the way of their interest. Glass blowers moreover, are well paid and well thought of in France. Besides their ample pecuniary remuneration they are certain to possess the esteem of their managers who can appreciate their capacity. This is one of the surest stimulants to increased production.

Flint-glass manufacturies excepting a few in this country, are generally managed as follows. Often times the manager of the factory is an individual who is completely ignorant of the first principles of the business, he therefore delegates his power to a foreman who may be better acquainted with intrigue than with the practical knowledge required of him, he is therefore at the mercy of his hands. At other times it may be an ex-blower who, though he may be an excellent workman, from the want of a general knowledge of the business, fails. In either case it follows that each hand is a sort of manager from the pot maker to the man at the grates, each of whom is supposed to have a deliberative voice in the management of the establishment. In such a state of things a consciencious and skillfull workman becomes indifferent and disgusted. It is a self evident truth that where order and good management reigns, every one contributes to the success of the establishment with his good will and skill; in a word, harmony is pleasing to all.

Having alluded to fire clay, above, being found in large quantities in this country let me say why this immense resource has not been made as useful as it should have been. Were it not for the intelligent discrimination manifested by a glass manufacturer, now of Philadelphia, Mr. W. T. Gillender, the utility of Missouri clay for pot making would be to this day a mooted point. Each glass manufacturer as is well known, manufactures its own pots for melting, and the pot maker is an important personage, at least in his own estimation, owing to the peculiar state of things existing. It is a noted fact that each factory pretends to have the best pots and the best pot maker, an opinion easily formed by those not acquainted with the properties of fire clay.

Let us suppose that clay is given to a pot maker, keeping him in ignorance of where it comes from, in order to avoid the splitting rock of his prejudices. Let him make a pot in his usual way. If the pot is not successful, he having learned his trade in the old routine, it is useless to seek a remedy from him, for let him tread out of his usual circle, he is lost and will not fail to charge the failure to the bad quality of the clay, and as I said before, his all-powerful opinion will shape that of his employer. The success of a factory depending especially on the good quality of pots, care should be taken and researches made by the manufacturer to attain the utmost perfection in this important branch instead of being dependent upon ignorant pot makers. This would not happen if the manager was well acquainted with this business; the success of this branch would depend upon him entirely. American clay properly prepared and well proportioned without addition of any other clay, is capable of making as good pots as those made from clay brought from Europe at great expense.

J. P. COLNE

Washington, D. C.

Correspondence.

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

A Mechanical Question.

MESSRS. EDITORS:—A gentleman in this section of country has been testing the draft of different wheel carriages to ascertain the most perfect construction that can be made to secure the ease of draft. His experiments show that 100 lbs. weight can be drawn up an inclined plane that rises four and a half inches in four feet, with 8 lbs. and 14 ounces draft and he expects to make the draft a few ounces less.

Be that as it may, the present development is a contradiction of correctness of scientific formulas upon which calculations are made. Not taking into account any allowance for friction, the formulas say that power is gained in proportion to the increased space through which it moves over that of the object moved.

According to the theory, four and a-half inches are contained in four feet, 10 and a little over $\frac{7}{10}$ times, which amount of hight the 100 lbs. weight is lifted, in moving four feet horizontally. Now if we divide the 100 lbs. lifted, by the draft of 8 lbs. and 14 ounces, it will be found that the draft is contained in the weight 11 and a little over $\frac{1}{10}$ times.

As much as 11 and $\frac{1}{10}$ is less than 10 and $\frac{7}{10}$ of 100, that much he has gained in power over what the popular theories in science says he could have gained, by the mechanical power up an inclined plane, added to this, he has gained the full amount of power that necessarily must be lost by friction Can you or any of your scientific correspondents explain this matter?

The gentleman alluded to, says that theories of science are wrong about not being able to create power by the application of the lever, and that the idea of creating power by moving through a greater space is only a coincident that attends the lever power by which it can be mathematically calculated. That it does not by any means follow that a gain of power is a necessary result of moving through a greater space. That an erroneous idea of the wedge being a mechanical power that could be mathematically calculated the same as the lever, has grown out of this mistaken theory.

To those who are disposed to treat his theory with contempt he can produce the ocular demonstration of the fact above stated, which to the practical man is much more important than fine spun theories. H. H.

Berlin, Wis.

[We see nothing strange in moving 100 lbs. four feet up an incline of four and a quarter inches by the weight of 8 lbs. 14 oz. provided the lesser weight is allowed space enough, an element which seems to have entirely escaped the attention of our correspondent. Is he not unnecessarily exercising himself about a problem which is solved every day in many ways?—[EDS.

Cleaning Marble.

MESSRS. EDITORS:—It may be of some value to telegraph operators, who have marble-based instruments and housekeepers who have marble-top furniture, to know that a common solution of gum arabic is an excellent absorbent and will remove dirt, etc., from marble.

First, brush the dust off the piece to be cleaned, then apply with a brush a good coat of gum arabic,about the consistency of thick office mucilage, expose it to the sun or dry wind, or both. In a short time it will crack and peel off. If all the gum should not peel off, wash it with clean water and a clean cloth. Of course, if the first application does not have the desired effect it should be applied again. C. G. F.

La Grange, Ky.

The Time Extended for Obtaining Patents in New Brunswick.

GENTLEMEN:—We forward you herewith notices of the granting of Letters Patent, to two of your clients, in the Province of New Brunswick. The new Patent Law for the entire Dominion will not come in force until after the meeting of the general Parliament some time during the coming Fall. In the meantime, by proclamation of the Governor General, under date of 1st of July, the present Lieut. governors of the Provinces are to hold office until further orders, and all existing laws to remain in force until repealed by new laws. The privilege of granting patents in New Brunswick, to foreign citizens, therefore still holds good, and will continue so until the passage of the new law. Any of your clients who may be desirous of securing their inventions, have therefore a few months left in which to do so. Of the provisions of the new law when passed, with reference to granting Letters Patent to foreigners, we have no certainty. Your clients had better take advantages of the present liberal law of New Brunswick, while the same is in force.

Your ob't serv't, L.

MESSRS. MUNN & Co., NEW YORK.

[Inventors desiring to avail themselves of the limited opportunity of obtaining patents in New Brunswick can have the business transacted through this office. Full information given on application to Munn & Co., office SCIENTIFIC AMERICAN 37 Park Row, N. Y.—EDS.

Delay at the Patent Office.

MESSRS. EDITORS:—Your appeals to the Commissioner of Patents to devise means so as to work up the accumulated business of the office, are well timed and just. As inventors pay the expenses of the concern, it is but just to them that promptness and dispatch should characterize the business transactions of the Patent Office. I have had a claim pending five months. How much longer I must wait remains to be seen. In a former patent I was twelve months in getting through to a finality. In reflecting over the delay I concluded that the efficiency of the attorney employed has much to do with the case. Having several more inventions for which I design making application for patents I have concluded, when I am ready, to try the editors of the SCIENTIFIC AMERICAN.

Some time ago I saw a notice of an invention to make glass from native ore, which the statement said had the tenacity of cast iron. Can you tell where it is made and the address of the manufacturers?

In a late number of your journal I see an article on the uses to which paper can be applied. Among them is that of making water tanks and pipes. If that branch is a success could it be used to advantage in the construction of pumps, that is, pump tubing? If so I would like to correspond with papier maché manufacturers. JOHN W. SHEAFFER.

Sterling, Ill.

[The inventors will be moved to hold an indignation meeting if a reform is not brought about pretty soon. The Patent Office was not established to yield a revenue to the government, and now when there is a surplus of money, it is a shame that it should be crippled in its efficiency.

The publication of our correspondent's inquiries will probably bring him in communication with the parties he desires to know.—EDS

Science Familiarly Illustrated.

Ventilation.

Look at an asthmatic sitting before an open window, regardless of the cold, though it be winter, with his chest heaving laboriously and his countenance expressive of exquisite anguish. What is the matter? Is he in pain? No. What, then, is the distress? It is simply from want of a due supply of fresh air. The spasm in his lungs not only prevents the free admission of air from without, but the free egress of that which is within, so that the air which is in the lungs is a mixture of foul and good air.

When so many died in the famous Black Hole at Calcutta, it was because the pure air was so shut out that they could not even get as much as the asthmatic does.

Here we have palpable results, and they startle us; and yet we may be suffering from day to day, in so small a way as to be imperceptible, the evil results of a deficiency of air, which may so accumulate as to impair the health, and even perhaps ultimately destroy life. It is only a few that occasionally lose their lives suddenly from want of air, but a comparatively slight but continuous deficiency in its supply is constantly destroying vast multitudes by a slow poisoning.

A good supply of fresh air is an imperative necessity. Such a supply it is easy to get when we are out of doors; but we do not get it when we are indoors unless we make special provision for it—or, in other words, unless we take measures to secure ventilation.

A proper supply of pure air in our habitations and places of public meeting *costs something*, at least in cold weather. That is the chief difficulty. Economy is in the way. Less fuel is required with defective than with proper ventilation.

A small room closely shut up is warmed at less expense than a large room with suitable inlets for fresh air, and outlets for foul.

The necessity for freeness in ventilation may be seen if we look at the amount of fresh air required for consumption. Each person requires a gallon every minute, that is fourteen hundred and forty gallons in twenty-four hours. It is easy to see that small and closely shut-up apartments, and large gatherings of people in public buildings, as they are ordinarily constructed, are incompatible with any such supply as this.

That you may see clearly what the necessity for ventilation is, observe what the lungs actually do with the air which they receive.

Pure air is composed of three gases, in certain proportions: oxygen, nitrogen, and carbonic acid; this latter being in very small quantity. These proportions are altered in the lungs, so that the air which is breathed out is different from that which is breathed in. It has less of oxygen and more of carbonic acid.

It is less vivifying by the loss of oxygen—that is, is thus negatively injured—and it has also acquired a positively bad character by the increase of the carbonic acid. Much increase of this renders the air palpably poisonous.

If, therefore, there be great lack of ventilation, as there often is in small rooms in dwellings, or in crowded public assemblies, much injury is done to the health by the diminution of vigor from the loss of oxygen, and by the direct poisonous influence of the added carbonic acid.

And if the exposure of these deleterious influences be frequent, there will inevitably be an accumulation of evil results, seen in a broken-down system, in positive disease, and at length in death.

Observe what provision is made in nature for the constant purification of the air, and how this is often more or less defeated by the arrangements of man. As oxygen is taken up in the lungs of all animals, and carbonic acid gas is sent forth from them, breathing is continually deteriorating the air. But this is remedied by a counter operation.

Every leaf that you see is doing just the opposite of what lungs do—it takes in carbonic acid and emits oxygen—so that there is an exchange going on between leaves and lungs. In this way the due proportion of the ingredients of the air is everywhere maintained, so that if the chemist examines air taken from various quarters of the earth, he always finds precisely the same proportions.

But this is true only of air that is free, and not of that which is shut up where there are sources of contamination. Wherever there is breathing going on, if ventilation be not properly attended to, there is a want of these natural proportions, and the deterioration is increased by fires and lights, for they, like lungs, use up oxygen, and return carbonic acid to the air.

There is still another important provision for the purification of air.

The three ingredients of the air are not of the same specific gravity. The carbonic acid gas is decidedly heavier than the oxygen and nitrogen, and therefore has a tendency to lie below them, as water lies below oil.

Now if this tendency were not obviated in some way, the carbonic acid, generated from lungs and fires and various decompositions, would accumulate all over the surface of the earth, pushing up the oxygen and nitrogen above it as water does oil, and would destroy life, and put out fires everywhere.

But this tendency is obviated by another—the tendency of gases to mingle together. It is just as the heavier water does not remain below the lighter alcohol poured upon it, but mixes with it. Agitation promotes this mingling, and therefore, in ventilation, the communication of motion to the air is an important measure, and should be accomplished so far as it can be done, without inconvenience.

There are other deleterious gases besides carbonic acid, produced in various ways, indoors and without, that are carried off by this same mingling and diluting process; but of these we will not speak, the carbonic acid being the most important.—*London Herald.*

London.

The growth of the town since the happy year when Londoners learned how, with proper accuracy, to count their own noses, presents us a record full of interest, and at the same time to us full of wholesome admonition to cultivate a grace rarely found in America—urban modesty.

In 1801 the population of London was	-	-	864,845
In 1811	"	"	- - 1,009,546
In 1821	"	"	- - 1,225,694
In 1831	"	"	- - 1,474,069
In 1841	"	"	- - 1,873,676
In 1851	"	"	- - 2,363,141
In 1861	"	"	- - 2,803,034

Taking the last census in each country as the standard of comparison, it appears that during the ten years preceding 1861 London added to itself a new city one half the size of New York, more than twice the size of Baltimore, nearly three times the size of Boston, more than three times the size of Cincinnati or St. Louis, and more than four times the size of Chicago. If the eight cities of Buffalo, Rochester, Albany, Pittsburg, Newark, Providence, Portland, and Milwaukee had been taken up bodily in 1861, put on shipboard, conveyed across the Atlantic, and deposited on the fringe of the skirts of London, they, with their united populations, would not have added to London so much as London quietly added to itself during the previous decennial period. Every twelve months a new city springs into being along the globous verge of London equal to the city of Cleveland.

Several years ago the metropolis, like some fabulous Cyclops, sprawled out upon its couch of 78,000 acres; but the original *city*, the venerable parent of this gigantean monster, is still content with that pigmy bed of 723 acres on which it has reposed for a thousand years. The *city*, though so small, is still the center of the trading, financial, and journalistic life of London, and has, it seems, a day population of 283,520 souls, and a night population of only 113,387 souls. Thus, every morning there come rushing into the city from suburb and rural cottage and country villa, to toil and get rich within the narrow walls of the old city, 170,133 persons, while there are 509,611 customers and clients who enter the city every day to deal with them. What tremendous energy, then, must be in the systole and diastole of this Cyclopean heart, whose throb can suck in and expel every day along its veins and arteries a living stream of 728,986 human beings!

Every morning nearly a million of men make a rush to get into a space of seven hundred acres, and every night they make a rush to get out of it. No wonder that in addition to streets on the level of the houses they are compelled to build streets under the houses and streets over the houses, and that in a few years there must inevitably be three continuous cities of London—terrene London, subterrene London and superterrene London. But the swollen and congested state of the veins and arteries of the mighty town is not the only source of anxiety. What shall London do for lungs? A meeting assembled some time ago, under the call of the Lord Mayor, to consider the peril arising from the disappearance of commons and open spaces in the neighborhood of the metropolis. The meeting was addressed by Thomas Hughes and other gentlemen of note. Mr. Benjamin Scott, the excellent and versatile chamberlain of the city, said that in dealing with the question before the meeting they should not confine their calculations to 3,000,000 inhabitants. He found that in 1861 there were 3,322,717 persons living within an area of sixteen miles, taking Charing Cross as the center. An increase of population had been going on within that area during the past half-century at the rate of $19\frac{6}{10}$ per cent every ten years. In fifty years, at this rate, the population of the same area would be 8,532,000 souls. What would be their position fifty years hence if they were allowed only the radius at present supposed to be sufficient? He found that in 1801 the people were twenty yards from each other, in 1851 about fourteen yards, and in 1866 something over nine yards. If this diminution of space went on for fifty years more, they would be more closely packed than his audience were at that moment—in fact there would be no standing room for them.

We may get some impression of the present magnitude of London by looking at a few details of its colossal state. Its houses number more than 350,000, and its streets, if placed in line, would extend from Liverpool to New York, and are lighted at night by 360,000 gas lamps, consuming every twenty-four hours about 13,000,000 cubic feet of gas. Of the water supply 44,383,328 gallons are used per day. The traveling public sustain 5,000 cabs and 1,500 omnibuses, besides all the other sorts of vehicles which human need can require or human wit invent. Its hungry population devour in the course of every year 1,600,000 quarters of wheat, 240,000 bullocks, 1,700,000 sheep, 28,000 calves, 35,000 pigs, 10,000,000 head of game, 3,000,000 salmon and innumerable fish of other sorts, and consume 43,200,000 gallons of beer, 2,000,000 gallons of spirits, and 65,000 pipes of wine. As a consequence 2,400 doctors find constant employment. London, finally, supports 852 churches which are presided over by 930 divines of greater or less note.—*The Nation.*

THE NEW ISLAND.—One of the vessels of the expedition which sailed in search of our new insular possession in the Pacific returned to San Francisco with only part of her crew, and taking on board a large force of men set sail again on the next day, under a fishing license. Public curiosity is much excited as to what the new land contains that the explorers are so anxious to secure. The position of the island is 40° 31′ north latitude and 151° west longitude, and the discoverer reports the land dotted with birds, and the water alive with seals and sea elephants.

Automatic Device for Holding Horses.

As a servant and companion of man the horse is a useful and valuable animal, but when he takes the bits between his teeth, when, as Job says, "he paweth in the valley, and rejoiceth in his strength," when he "swalloweth the ground with fierceness and rage," that is, takes a race-course gait, he becomes a troublesome customer.

Multitudes of accidents to life and limb are daily chronicled in the papers caused by runaway horses. Valuable lives are lost, persons crippled for life, and property to a large amount destroyed for the want of properly hitching teams, or neglecting to tie them at all. Hitching posts are not always convenient, and so the driver, hoping his team will stand during a momentary absence, leaves them; they are startled by a fluttering paper, a puff of steam, or the screech of a whistle, and he returns to find his vehicle a wreck and his team ruined.

There have been several devices to prevent horses from running away when the driver was absent such as the strap and weight used by physicians, as an anchor to the horse, and an attachment of a halter to the wheel by means of some mechanical device, but this one claims to possess advantages over any other which has yet been tried.

Fig. 1 gives an idea of the device as attached to a wagon, and Fig. 2 shows its construction and operation. It is a ring surrounding the hub of a wagon or carriage, and secured to the spokes by the lugs and screws, A. This ring has, on an inner projection, a series of ratchet teeth, as seen at B, with which a catch sliding into a receptacle in the shank of the loop, C, engages, being moved forward by a light spiral spring. The loop, C, forms a part of an exterior ring which turns freely on the ratchet ring and is secured in position by the back projection of that, and also by the outer casing or ring, D, which is represented as broken away, to show the inner ratchet, for about one fourth the circumference.

It will be seen now if the reins of the horse, or a halter, be secured in the loop, C, (in the engraving a common rope is shown,) any effort of the horse to start or run away will only result in winding up the line, and the further he draws the carriage the more the line will be wound around the hub. Of course the pull upon the horse's mouth will be very severe as the leverage is so great. In one direction, the pawl would, of course, merely slide over the teeth of the ratchet, while, in the other, the wheel could not be moved far until the pawl became obstructed by the teeth of the ratchet. The first is the condition of being "backed," the other the moving ahead. Beside being a preventive of danger, this device seems to be admirably adapted to break young horses to stand.

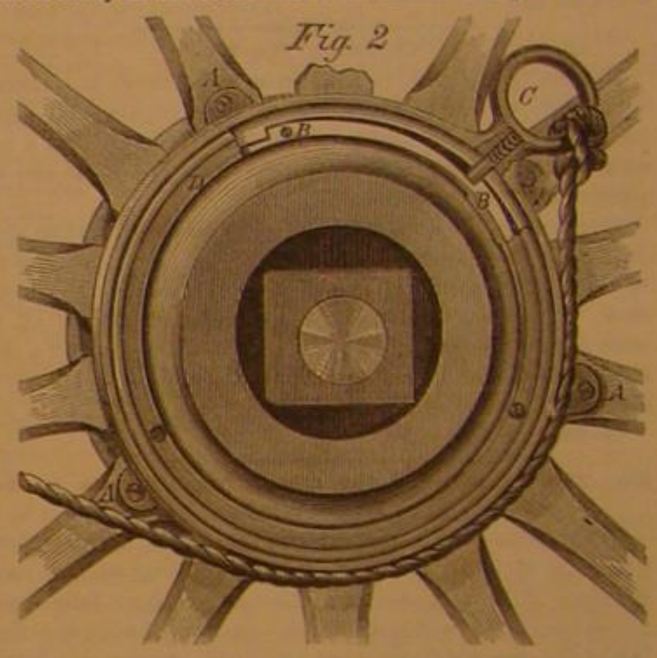
This improvement can be attached to any carriage, wagon, or other vehicle without making any alteration in the wheel hub, and is so simple as not to be liable to get out of order. It was patented through the Scientific American Patent Agency, Nov. 13, 1866. Further information regarding it may be obtained by addressing W. B. Chapman & Co., La Salle, Ill. [See advertisement on another page.]

Fig. 1.



CHAPMAN'S HORSE HOLDER.

Fig. 2



THE SIEMENS FURNACE.

There is a small collection of gas-furnace models exhibited at Paris by Messrs. Siemens, and now distinguished with the highest prize of the international jury, viz., the "grand prix." It may be said with justice that the Siemens furnace in this present Exhibition holds much the same position which the Bessemer process held in 1862, viz., that of the most important and most successful metallurgic invention of the day. It is hardly less important than the Bessemer process, and although its invention dates about as far back as Mr. Bessemer's patents, it has only lately attained commercial success. In the space of the last five years the Siemens furnace has not been very materially altered or improved, but it has been largely introduced and its success established in many different branches of industry. The first manufacturers in England who availed themselves of the new furnace, were the glass-makers. For purposes of metallurgy greater difficulties and prejudices required to be surmounted. Some of the steel makers on the continent led the way. Mr. Mayr, of Leoben, in Styria, we understand to have been the first to introduce the new furnace for crucible steel making on a large scale. In this instance the unfavorable position of the Styrian iron works with regard to the supply of mineral fuel, was the principal inducement to apply gas in the steel-melting furnace. The gas is made at Mr. Mayr's works, from lignite, which cannot be directly applied for melting steel, as the heat from it when burnt on the grate, is not sufficient to produce the high temperature required for this operation. Mr. Mayr erected ten gas furnaces, and they have proved a complete and perfect success, enabling him to make crucible cast steel by means of the cheap and very inferior lignite which exists in his locality. Within the last two years the Siemens furnace has been adopted in all the larger Bessemer steel works in England. In France, the Siemens furnace is gaining ground with equal rapidity, and there are now twenty furnaces in course of erection under Mr. Siemens' own superintendence at the Creusot Works.

There are two distinct principles embodied in the Siemens furnace, viz., the application of gaseous fuel, and the regeneration of heat by means of piles of bricks alternately passed over by the waste gases and by the gases entering the furnace before their combustion. The gas producer is a brick chamber about 6 feet wide by 12 feet long, with its front wall inclined at an angle of 45° to 60°, according to the nature of the fuel used. The inclined plane is solid about half way down, and below this it is constructed as a grate with horizontal bars. The openings for introducing the coal into the gas producer are on the top or roof of this chamber, and the air which enters through the grate effects the combustion of the coal at the lowest points of the chamber. The products of this combustion rise, and are decomposed by the superposed strata; they are, moreover, mixed with a quantity of steam which is drawn in through the grate from a constant supply of water maintained underneath the latter. The steam in contact with the incandescent coal also decomposes and produces hydrogen and carbonic oxide gas, which are mixed with the gases produced by the coal direct. The whole volume of these gases is then conducted to the furnace itself by means of wrought-iron pipes. The gases enter one of the regenerators. The regenerators are chambers packed with fire-bricks, which are built up in walls with interstices and air spaces between them, allowing of a free passage of gas around each single brick. Each regenerator consists of two adjoining chambers of this kind, with air passages parallel to each other, one passage destined for the gaseous fuel, and the other for the supply of atmospheric air required for combustion. Each furnace has two such regenerators, and a set of valves is provided in the main passages, or flues, which permit of directing the gases from the producer to the bottom of either of the two regenerators. The gases, after passing one regenerator, arrive at the furnace, where they are mixed with the air drawn in at the same time, and produce a flame of great heat and intensity within the body of the furnace itself. They then pass, after combustion, into the second regenerator, which forms a set of down flues for the waste gases, and ultimately leads them off into a common chimney. On their way from the furnace to the chimney, the heated products of combustion raise the temperature of the fire bricks over which they pass, to a very high degree, and the gases are cooled more and more the further they proceed through the regenerator. After a certain time the fire bricks close to the furnace obtain a temperature almost equal to that of the furnace itself, and a gradually diminishing temperature is arrived at in the bricks of the regenerator proportionate to their distance from the furnace. At this moment the attendant, by reversing the different valves of the furnace, opens the heated regenerator for the entrance of the gaseous fuel and atmospheric air, at the same time connecting the other regenerator with the chimney for taking off the products of combustion. The entire current of gases through the furnace is thus reversed. The cold air from the atmosphere, and the comparatively cold gases from the producer, in passing over bricks of gradually increasing temperature as they approach the furnace, become intensely heated, and when they are mixed in the furnace itself, enter into combustion under the most favorable circumstances for the production of an intense heat. The principle of this so-called regeneration of heat, therefore, consists in storing up the waste heat in one set of fire bricks, and afterward making use of that heat for elevating the temperature of the fresh gases introduced for combustion. The action of these regenerators is so perfect that, with a temperature of somewhat about 4,000° in the furnace, there is no more than about 300° to be felt at the base of the chimney, the escaping gases having a temperature no greater than is absolutely required for maintaining the draft.

This is the present state of this beautiful and important invention. It has supplied us with the power of maintaining an exactly regulated temperature in a furnace of any required size and shape; it has made us practically independent of the quality and nature of the fuel used for producing the required heat from the most moderate, up to the very highest temperature. It has reduced the expenditure for fuel to a very great extent, and it has given us one of the greatest desiderata in so many metallurgical operations, viz., a *clean* furnace, free from ashes, dust, and dirt, and perfectly suitable for the working of the more refined and purified materials which modern industry has produced and is still constantly improving upon. We have further to name as an important feature of the Siemens furnace, the possibility afforded by it of changing the nature of the flame at will, by altering the relative proportion of air and gas admitted through the flues. A surplus of oxygen in the mixture will produce an oxydizing flame, and will give all the corresponding effects upon the materials exposed to its action. By the admission of a surplus of gas, on the contrary, the flame can be made of a reductive character, and used accordingly for de-oxidation. In metallurgy, and particularly in the treatment of iron and steel, this is of the utmost importance. There are already several new modes of manufacturing steel direct from the pig iron, patented and practically carried out in France and in Germany, wherein the Siemens furnace is made use of as an indispensable condition for their success. The Exhibition contains a collection of samples of very fine steel made by M. Berard's process. This is called "Acier à gaz," and is made in a Siemens furnace direct from pig iron. M. Berard constructs a Siemens furnace with the bottom formed into two separate parts, each hollowed out like a dish, and with a bridge between them upon which the pigs introduced into the furnace receive a preliminary heating. The flame is maintained with a surplus of oxygen, and a quantity of pig iron is melted in one of the chambers or dishes. The oxydizing action of the flame decarburizes and refines the pig iron, and after a certain time a second quantity of pigs is thrown into the second dish and melted there. The flame is now reversed in its direction; the oxydizing flame is made to enter at the side where the fresh pig iron is placed. In passing over this, and oxydizing the carbon, silicon, and other impurities in the iron, the flame loses its surplus oxygen, and becomes of a neutral, or at least only slightly oxydizing character. In this state it passes over the other bath of molten iron, now partly refined, and it continues to act upon the impurities without attacking the iron itself. At a certain moment this portion of iron is completely converted into steel, and that part of the furnace is then tapped so as to make room for a fresh charge of pigs in that place. After that the current of gases is again reversed, the second bath now entering into the position previously taken by the first, and so the process is carried on continuously with two portions of iron, one freshly introduced and acted upon by the oxidizing flame, the other partly converted into steel and exposed to the neutral flame passing away from the first. M. Berard states that by protracting his process, and by adding spiegeleisen, he can remove sulphur and phosphorus from the iron, and make steel from inferior pigs. Such statements, however, have been so frequently made by inventors, without having been borne out by facts in actual practice, that we must be cautious in accepting them.

Messrs. Emile and Pierre Martin, of Sireuil, have also commenced steel making in a Siemens furnace. They melt a quantity of pig iron, and introduce wrought-iron scrap, puddled steel, or other malleable iron into the mass while exposed to the oxydizing influence of the flame. They have produced steel of excellent quality by this method, and are now about to introduce their process into several steel works in France. The great advantage obtained by them, and one which has not yet been arrived at by the Bessemer process, is the conversion of old iron rails and similar articles into steel. This is a great desideratum—particularly at this present moment of transition of the permanent way from iron into steel—is well known, and attempts have been made by Mr. Bessemer, Mr. Adamson, and several others, to effect the same thing in

the Bessemer converter. The first trials, although they proved the possibility of converting old iron rails into steel in that manner, gave an unsatisfactory commercial result. It was found that the rails required to be heated to a white heat before being introduced into the converter, that no more than one third of such rails could be added to the proportion of two thirds of very graphitic pig iron, and, with all this, that there was a greater waste in the converter, and more "scull" in the ladle, than with pig iron. Messrs. Martin, on the contrary, are able to use a proportion up to two thirds of old rails to one third of pig iron; they can manage the fusing very completely, and without excessive waste, and with a moderate consumption of fuel, advantages which are all due to the Siemens furnace which they employ. Mr. Siemens has himself very recently patented an application of his furnace to the manufacture of iron and steel direct from the ore, and he has exhibited a model of such a furnace in Paris, to which is added a small piece of steel produced in that manner direct from the iron ore. The furnace is constructed somewhat similar in form to the Rachette furnace, viz., with two parallel sides sloping downward so as to form a kind of trough between them. The ore is charged at both sides on the top of the furnace, and slides down the inclined planes of the two sloping sides. At the bottom of the furnace the gases from the producer and the necessary supply of air are admitted, and produce an intense flame, the products of combustion rising upward through the masses of ore, which are acted upon in a similar manner to that in the blast furnace. With very pure manganese ores it is possible to manage the process so as to decarburize the newly produced iron immediately after it is made, or rather the heat can be made sufficient for melting a metal which contains less carbon than common cast iron as made in the blast furnace, and at a lower temperature. This metal is natural steel, or "raw" steel, and, made from ores of sufficient purity, may have all the qualities of the best cast steel. The specimen exhibited by Mr. Siemens, and made, we understand, at his Model Steel Works in Birmingham, where the first experiments with this new process have been carried out, is of very fair quality as far as can be judged from its general appearance and fracture. We have been informed that Mr. Siemens is now erecting a similar furnace at Barrow-in-Furness, intending to make steel from hematite ore direct, at the Barrow Steel Works. Mr. Siemens' new process, if successful and economical, would do away with blast furnaces, and all other processes for making and refining iron now in use, but it is too little advanced at this moment to allow of a judgment of the probability of its practical success, to say nothing about relative economies. Its practicability remains to be established; but if we consider how much the same inventors have already established, how difficult it was to believe in the success of the Siemens furnace itself when first brought out, and how completely they have succeeded in this respect, we may be justified in entertaining some hope that this new invention will ultimately prove equally successful, although at present it may appear very revolutionary and contrary to adopted notions.—*Engineering.*

MEE'S HOSE COUPLING.

The intention of the inventor in this device, is to make a tight coupling without the aid of a washer, or of the loose setting-up ring, or of any device for forcing the two parts of the coupling together in the line of their axes, in order to form a water-tight joint. This coupling does not depend upon the mechanical force exerted to close the joint, but the pressure of the water itself makes the joint tight.

Fig. 1.

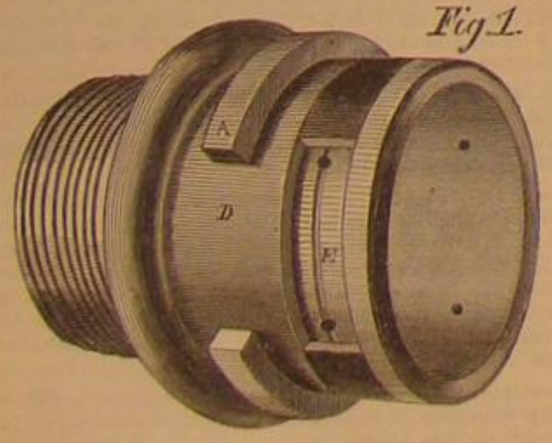


Fig. 2.

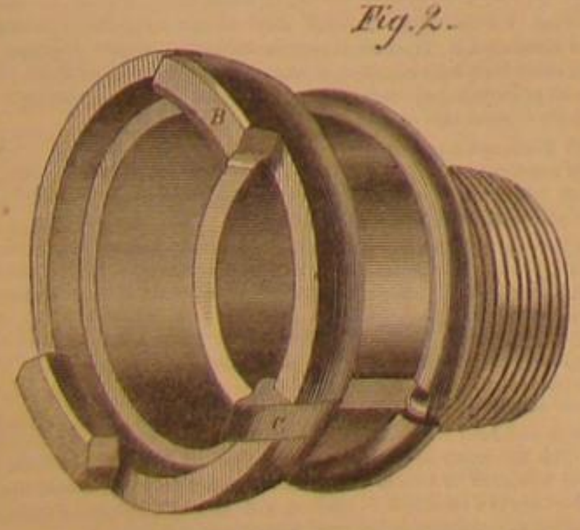
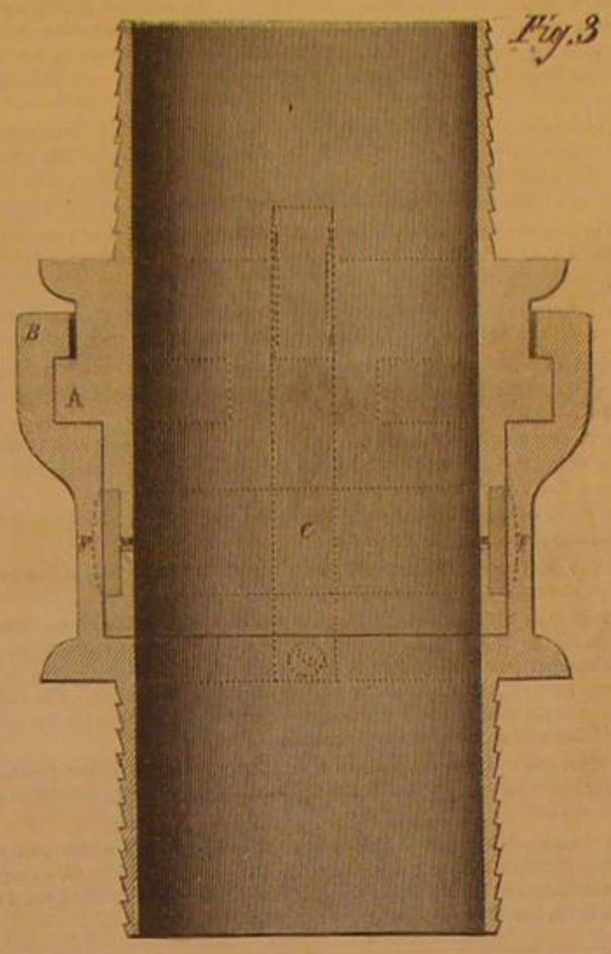


Fig. 1 represents one end of the coupling, formed where the cather or rubber is attached precisely like any other, but otherwise differing. It has a projecting ring, A, around the barrel part, a portion of which ring is cut away to receive the hooks or snugs, B, Fig. 2, which pass by the ring, A, and, by a slight turn of one or the other part, securely lock the two lengths of hose or the two parts of the coupling together. This partial turning is, of itself, a sufficient lock to the parts, but to render "assurance doubly sure" a spring catch, C, is introduced which springs into the space, D, Fig. 1, between the parts of the ring, A, and prevents the parts from unlocking unless force is used to raise it from its seat.

Near the end of Fig. 1 is turned an annular groove in which is seated a rubber ring, or a ring of some elastic substance to

Fig. 3



act as a packing. It will be noticed that a row of small holes is bored through from this annular recess to the inside of the coupling, the holes communicating on the outside with one another by a channel, E. Through these holes the water inside the hose or coupling finds its way, and its pressure forces out the elastic ring against the inner surface of the section shown in Fig. 2, making a perfectly water-tight joint. Fig. 3 is a longitudinal section, and will give a correct idea of the invention. It represents the parts, as connected, with a recess at F, which, if thought expedient, could be made to receive the extension of the flexible packing when the pressure is applied, although it is believed from numerous experiments this is not necessary.

A patent for this improved coupling was obtained by Barney Mee, May 7, 1867. It is manufactured by Mee & Jackson, Troy, N. Y. Applications for rights, etc., will be promptly attended to if addressed as above. It can be seen in this city in use at No. 99 Wooster street, on engine No. 13.

Mechanical Uses of Castor Oil.

We find in one of our exchanges the following remarks relative to the use of caster oil in the trades, more particularly its application to leather: It is much better to soften and to redeem old leather than any other oil known. When boots and shoes are greased with it, the oil will not at all interfere with the polishing afterward, as is the case with lard, olive, or any other oil. In Harrisburg, Pa, the old leather hose of some of the fire companies was greased with it, and found to become almost as soft and flexible as new leather. Leather belts for transmitting motion in machinery will usually last three to five years, according to the wear and tear they are exposed to; when greased with castor oil they will last ten years or more, as they always remain flexible and do not crack. Beside this advantage, castor oil will prevent slipping, so that a belt three inches wide, impregnated with it, will be equal to a belt four and a half inches without castor oil. It is necessary, however, to wait twenty-four hours, till the oil has disappeared from the surface and penetrated the leather, otherwise the freshly greased surface will cause slipping. The rats and other vermin detest anything impregnated with castor oil, and will not touch it;—another advantage.

Geography of Plants.

In an article on this subject by M. T. Lippincott, of New Jersey, the following rules were given, for determining the fitness of districts in the United States for the growth of certain varieties of wines.

Those places which have a summer temperature of 65.6°, a hot month of 70°, and a September of 60°, will ripen Delaware, Clinton, Perkins, Iona, Logan, Israella, with other hardy varieties. The temperature of their growing season corresponds to a mean of 65° and upward, and an aggregate of heat of about 8,000° Fah.

Those places which have a summer of 70°, a hot month of 72°, and a September of 63°, will ripen Concord, Hartford Prolific, Diana, Creveling, etc. Their season of growth corresponds to a mean of 67°, and an aggregate of 8,500°.

The Isabella requires a summer of 72°, a hot month of 73°, and a September of 65°, and a mean during its growing season of 70°, and an aggregate of 10,000°, of heat, etc. etc.

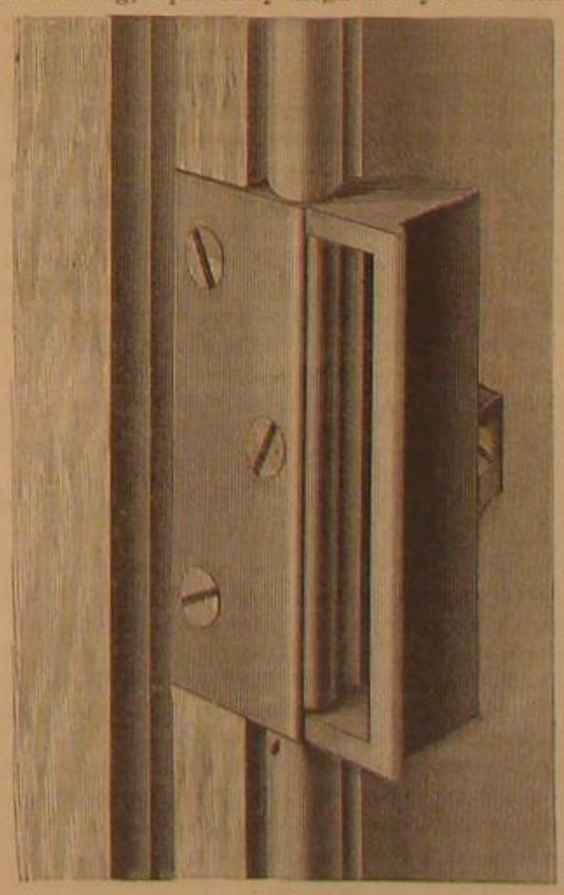
The summer temperature of Buffalo, N. Y., is 68°; it has a hot month of 72° and a September of 62°; and it is said that the temperature of places on the banks of the Niagara, north of the city, is from two to three degrees greater.

Washing the Streets.

To keep the streets of a great city clean is a problem which those who have thought the least about it are the most ready to solve. Those who understand it find their greatest difficulty in the cost. In the city of London, where every feasible scheme of street improvement may be tried, Mr. William Haywood, the engineer to the Commissioners, has been trying a series of experiments in "cleansing streets by washing"—a plan that seems very easy but is not very cheap—and has made a report from which the London *Journal of Gas Lighting* extracts the following reliable information. A portion of one of the principal thoroughfares was selected, 2,000 feet long, having a superficial area of carriage way of a little under 10,000 yards. Sixteen hydrants were fixed at a distance of 16 feet from each other. The first experiments were made in September last, and they were continued for a week at a time at different periods of the year; the weather, however, happened on each occasion to be tolerably fine. Ten men were employed with two jets, each morning for two hours and three quarters. Two men, who assisted in moving the hose, also swept the surface near the curbs while the water was playing, so as to save passengers from the annoyance of the jet being directed close to the foot-ways. The straw and refuse which would not go down the gullies was washed into the channels by the action of the water, and was then swept up and removed by scavengers. The quantity was scarcely a quarter of a load daily. The work was generally done between half-past two and six o'clock in the morning. The quantity of water consumed was about two gallons to each square yard. The streets were much cleaner than after ordinary scavengering, and this was most marked when rain came on after washing, for the surface did not become muddy until toward the end of the day, while the other streets of the city became muddy rapidly. On the whole, the comparison was greatly in favor of the surface cleansed by water. The cost of the machinery was £1175 per mile lineal; the cost of washing nearly 20s. for each washing, labor forming about half of that sum. There are about seven miles of thoroughfare in the city similar to those washed, and the annual cost of cleaning them by water would amount to £7932. These seven miles are leading thoroughfares. The cost of water at its present price would amount to £3282 per annum, and for the whole city, to £6000 per annum. But this is filtered water, of the same quality and price as that supplied to the breweries. Mr. Haywood suggests that the water should be obtained direct from the Thames, and if the washing system be adopted, the magnitude of the demand would justify some expense in pumping machinery for obtaining a cheaper supply. It would be objectionable to wash the streets in frosty weather, and in severe weather it would be impossible to use it; therefore the services of a staff of men, carts, and horses must be retained for emergencies. Pavements kept so clean will be more slippery during dry weather, and less slippery in damp greasy weather. The superior cleanliness will make the streets more noisy. Mr. Haywood thinks that the sewers would not be injured, and that the sewage about to be used for the reclamation of waste land would be improved by the admixture of street sweepings.

DA CUNHA'S LOCK CATCH.

Improvements in the form and style of articles in common use are not among those least valuable. Sometimes, indeed, an alteration which at first view appears to be quite superficial and trifling, is proved by use, if not by examination, to



be a radical improvement. Such, we conceive to be that represented in the engraving. It is a catch for ordinary door locks, those which are secured to the outside of the door, and differs from those ordinarily in use in being much stronger in construction, and much more securely attached. The common catch is held to the door jamb by two or more screws, the strain upon which tends continually to draw the screws from the wood.

This catch is of cast or malleable iron made with a project

ing lip to be let into the inside of the jamb, and held by screws, which, when the door is closed, are covered by its edge. On the back of the catch, is also another projection, through which one or more screws pass into the casing. These screws resist the shock of the spring bolt of the lock, and those on the inside of the jamb the strain upon the door itself, in a direction at right angles to their length. Thus it will be seen that the catch is secure against all chance of accidental displacement.

It was patented through the Scientific American Patent Agency May 21, 1867, by George W. Da Cunha, who may be addressed relative thereto at 311 West 36th street, New York City.

"Porter Spare that Trunk."

The Philadelphia *Ledger* says—and we know it is so—for we went traveling once, that at this season of the year the above is a daily and hourly request at the stations on all great lines of railway; but it is by far too often a vain request for down goes the trunk with a crash—the lock is broken and the contents of the unfortunate receptacle are scattered over the ground to the dismay of the owner and alarm of other travelers around, who are left to anticipate a similar mishap to their own baggage. If the sufferer be a lady, and, as happens every now and then, without a male escort, she is obliged to look helplessly at her dresses and articles of toilette rolled in the dust and dirt; and if gathered up and stowed away in the trunk by some good-natured person near, they are in a sorry plight. The porter or baggage man in place of apologizing for the mischief which he has carelessly done, will most likely be heard to growl and mutter words of insolence and defiance, as if he had only exercised one of his reserved rights. Baggage masters and their assistants are often equally as reckless as the surly porter, of a decent regard for the property entrusted to their charge, as shown in the way in which they toss our trunks and other luggage, or throw them from one part of the car to another. Ladies are not the only sufferers by this abominable practice. It may be alleged that these cases are exceptional, and of rare occurrence. Most travelers will tell us, in reply, they are incidents witnessed on every long line of railroad, and especially in the summer months, when so many leave their homes in pursuit of health and pleasure. Very pleasant indeed to have one's trunk smashed and clothes spoiled! There seems to be a fixed determination, on the part of porters who carry luggage to steamboats and depots, and from them to hotels, to test the strength of trunks, and as far as in their power, snap the iron bands, to break off straps, which they seize held of in place of the handles, and to wrench hasps and bolts of locks from their fastenings. There is an apparent trial to ascertain which has the greatest power of resistence—the trunk, or the pavement, or the platform, when the first is thrown down as if it were in the performance of some gymnastic feat for a wager. Is it not time that there should be a class of civilized trunk carriers—of men who understand that they should be careful of goods intrusted to their care.

New Base for Artificial Teeth.

Dr. G. F. J. Colburn, of Newark, N. J., has invented a substitute for rubber in dentistry, which promises to be of much value to the profession. It is in reality a cement of which the mineral asbestos is one of the ingredients. Asbestos is a very peculiar substance. It is exceedingly light, and so very fibrous in its nature that it may be spun and woven like cloth, in which condition it resists fire, water, and many of the acids with complete success. Taking advantage of these natural qualities Dr. Colburn has, by long study, discovered additional substances, which, when united, form an artificial base that possesses remarkable toughness, adherence, strength and lightness. The ease and freedom with which it can be molded is a strong recommendation. It can be readily applied to gold, platinum and other plates. We have seen some full sets of teeth on aluminum plates that were truly beautiful. This new base contains no ingredients injurious to the health of the mouth or system. It is not affected by acid secretions, is free from all taste, and is inodorous. We hope that its merits will be thoroughly tested. Patents have been allowed.

Agricultural.

There are 23 applicants for the position of Commissioner of Agriculture, made vacant by the death of the Hon. I. Newton, viz.: Norton S. Townshend of Ohio; John A. Warder of Cincinnati; Thomas Brown of Ohio; Col. Capron of Illinois; the Hon. John B. Clark of Missouri; the Hon. James Birney of Michigan; the Hon. L. Chandler Ball of New York; F. M. Blair of Washington, D. C.; William H. Ludlow of New York; Oliver H. Kelly of Minnesota; A. S. Paddock of Nebraska; the Hon. James R. Hubbell of Ohio; Isaac Newton, jr., of Pennsylvania; Thomas P. Robb and Solsom Dorsett of Illinois; E. C. Wilson of Pennsylvania; R. J. Powell, John H. Klippart of Ohio; the Hon. Frederick Holbrook of Vermont; James S. Grinnell of Massachusetts; William H. Russell of Washington; the Hon. W. T. Lemosy of Virginia, and the Hon. E. H. Hyde of Connecticut.

BUSINESS AND MANUFACTURING ITEMS.

The capital invested in agriculture in England amounts to £3,311,000,000, returning a profit of 13 per cent.; the capital invested in manufactures is £213,000,000, and the annual profit is 120 per cent.

The French ladies spend 8,000,000 francs per year for corsets, 15,000,000 for gloves, and 10,000,000 for bonnets. False diamonds cost them 1,900,000 francs, false teeth 1,500,000, glass eyes 84,000, masquerade dresses 730,000, perfumery and cosmetics 22,000,000, fans 5,000,000, artificial flowers 28,000,000.

The directors of a railroad in New Jersey are said to have offered to parties who will build on the line of their road, a free pass over it from three to five years.

Since the year 1861, there have been sunk in the United States 7,930 oil wells, yielding a total product of about 11,640,670 barrels of crude petroleum.

The universal belief in abundant crops this year, has brought a class of speculators into the field who have bought up all the grain bags in market, much to the disgust of the farmers. The market for reapers and mowers has also become quite active in preparation for reaping the new crop.

The works of the Boston Belting Company, at Roxbury, Mass., the largest establishment of the kind in the country, covers five acres of land and constantly employ 150 hands. Packing for machinery, engine hose, and tubing, are among its products. The consumption of stock at the present dull season reaches $75,000 per month.

Watch chains are now made by machinery by the pioneer firm in this line in New England—Sackett, Davis & Co., of R. I. The machine is their own invention, and is pronounced one of the most ingenious and elaborate pieces of work ever devised. By means of it bar gold is transformed rapidly and without noise into the most delicate, or substantial fob and vest patterns of chains.

In the exportation of coal, Erie, Pa., ranks second in the United States. Over 250,000 tuns was shipped from this port during the year ending Jan 1st, 1867. The bituminous coal is taken to ports on the upper lakes; principally to Chicago. The return freights are made up from Lake Superior copper.

The projected railroad from Atlanta, Ga., to Decatur, Ala., when completed, will effect a saving of more than 100 miles in the distance traveled between Memphis and Charleston.

The Chicago tunnel cleared forty-six thousand dollars for the contractors. The project of a great park at Chicago was defeated at the recent election.

Sargent & Co., of New Haven, have the largest hardware manufactory in the country, employing 800 hands, and turning out 4000 different kind of articles, valued at from $1,000,000 to $7,000,000 per year.

English authorities estimate the proportion of passengers killed in Great Britain by railway accidents, as only one in four millions; the number of employees killed is very much larger than that of passengers.

The American Steel Company will soon erect works at East Bridgeport, for the manufacture of cast steel.

A company of capitalists are about building an extensive mill at Paterson, N. J., for the manufacture of nails.

The Boston and Worcester railroad, on one day during the recent visit of the President to the former city, carried more than 21,000 passengers, the largest number ever transported over the road in a single day. Not one of these was injured, nor was there an engine or car off the track. The superintendent of the road has issued an order thanking his employees for their care, fidelity and attention on this occasion.

A road locomotive was successfully tried in the streets of Rome, recently, the experiment being made under the direction of the artillery officers of the Pontificial staff.

At St. Anthony's Falls, Minn., there are six mills, each of which turn out 6,000,000 to 12,000,000 feet long lumber, per year. Last year 30,000,000 shingles were manufactured in this vicinity. The flour mills at this point have a capacity of 3,000 barrels daily.

Editorial Summary.

DEATHS BY CHLOROFORM.—As early as 1859 Barrier de Lyon ascertained that there had been over two hundred recorded deaths from the administration of chloroform as an anesthetic. In the next five years, Diday reported twenty-one registered cases, and at least as many unregistered, in England alone. Some cases, like that at Bellevue Hospital last winter, could not be attributed to any impurity of the article or imperfection in the administration. Canter remarked that half his chloroformized frogs died, and hardly any of his etherized ones. Unlike ether, the action of chloroform continues after its application is stopped.

GIGANTIC omnibuses, on a new model, have been constructed in Paris, specially for horse races and other out-door sights. They are so contrived that upward of fifty persons can be seated on the roof, and they constitute a kind of traveling grand stand.

CALIFORNIA MARBLE.—A pure white marble of a superior polish, and rivaling the finest Italian, has been discovered near Colfax, Cal., and only two miles from the Pacific Railroad.

A LOVER OF POTATOES.—A wealthy citizen of Berlin has applied to the municipality of that town for a site on which to erect a statue to Francis Drake, as the introducer of the potato into Europe, and offers to subscribe $11,270 toward it.

SALMON IN AUSTRALIA.—The latest experiment in pisciculture has been the raising of the salmon in the river Derwent. Three years since the first batch of salmon ova arrived on those shores, having been transported sixteen thousand miles on ice. After this protracted journey the fish hatched from the ova, were turned out into the river, and now the inhabitants are rejoicing over a fine run of veritable salmon.

A MONSTER CHERRY TREE now growing in Reading township, Ohio, has attained the hight of 80 feet, and is four feet one inch in diameter. It is of the "black heart" variety, and the seed was brought from Berks County, Pa., in the year 1817.

PARISIAN PINE APPLES are made by saturating turnips with a sirup which the confectioners know very well how to manufacture. The resulting fruit is said to be delicious, and is quite popular among the Exposition visitants. In this city, a few days since, it was testified in court that the jellies sold as made from strawberry, pineapple, and other fruits were all formed out of apple jelly, colored and flavored with essences to suit the name.

SWITZERLAND has 3,500,000 inhabitants and 345 scientific and literary publications, while France, with ten times the population, has but about 500 journals and magazines. The solution of this is in the fact that in Switzerland the people all receive some education, and consequently can read, and take the papers, while in France less than one half can read.

TRANSPLANTING FULL-GROWN TREES.—Thirty beautiful elms fully forty feet in hight, were removed from their native forests, and replanted in front of the site of Congress Hall at Saratoga, to take the place of the trees destroyed by fire. They are now in full leaf and appear to be thriving under this singular treatment. The same thing has been successfully accomplished in Scotland, also in Paris.

THE BANK OF ENGLAND has 50,000,000 in gold coin now on hand, there being no call for it, notwithstanding the low rate of interest. This is owing to dullness in business, and the falling off in the foreign trade, which has been ten per cent since September last.

SHEEP-SHEARING BY WIND.—A man in Wisconsin has a patent sheep-shearing machine which operates just like a reaper or a mower, and mows a swath of wool an inch and a half wide. The motion is got by means of a little wind engine in the handle, which is to be driven by a force pump or bellows forcing wind into it by a flexible tube.—*Beaver Dam (Wis.) Citizen.*

A NEW method of vitrifying the surface of iron has recently been introduced in Paris. Instead of covering the surface of the iron according to the usual method with a very fusible glass in powder and then bringing the iron to a red heat, the materials of the glass are laid upon the iron, which is heated until perfect vitrification takes place. The consequence is that the iron becomes oxydized, and combining with the silicic acid, the iron and glass form one substance. The coating may be as thick as desired, but it is found in practice that a thick coat of glass soon breaks away, while a thin one lasts for a long time. The method is being applied or tried upon armor plates for ships.

THE STRAWBERRY growers of Vineland, N. J., during the season just ended raised nearly 275,000 quarts of strawberries, valued at $33,000. Of these, 65,000 quarts were consumed or canned at home, and the balance were shipped to Philadelphia, New York, and other points. . . An Ohio fruit grower succeeded this year in raising one bushel, three pecks, and three quarts of strawberries from a square rod of ground.

A ROOM FULL OF GOLD.—Pure gold is nineteen times as heavy as water, and as a cubic foot of the latter weighs a thousand ounces avoirdupois, the same dimension of gold would weigh 19,000 ounces, valued at somewhat more than eighteen dollars per ounce, or the whole would be worth a little more than a third of a million dollars. The amount of the precious metal now existing is estimated at $5,950,000,000, in value. If now this was melted, the resulting mass would have nearly 660 cubic yards, and might be placed in a room five yards high, eight yards wide and sixteen yards long.

SOME beef which was deposited in tins beneath a heap of stones in Spitzbergen, by Capt. Parry, in 1827, was recently discovered, and a portion was cooked and eaten at a supper in Stockholm, after being preserved for forty years.

MINERS' LAMPS.—Notwithstanding that every English miner who is detected in unlocking his safety lamp is liable by law to three months' imprisonment, the offense is committed with impunity by means of false keys. A simple plan has been invented by a manufacturer of these lamps, for sealing them without using any lock. When the staple has been put down over the eye, a small leaden pin is inserted in the latter, then being placed under a horizontal press fitted with two dies, the shank of the ping is formed into a head, and both heads are impressed by the dies with any lettering or device.

PARISIANS are fond of confectionery. According to the Chamber of Commerce about eleven millions of francs were spent in bon bons last year.

DEVILLE has lately made the observation that the addition of a little zinc amalgam to ordinary solder makes it applicable at low temperatures to aluminium bronze, cast iron, and also, no doubt, to other work in which quicksilver would not be objectionable.

THE SEVENTEEN-YEAR LOCUSTS have made their appearance over a belt of country, just northwest of Wilkesboro, N. C., extending far northeast and southwest, and being from thirty-five to forty miles broad. It is a singular confirmation of the claims of these insects to their popular name, that this identical stretch of country was visited by them in 1850 and not since.

FRANCE realizes over seven million dollars annually from the door and window tax, and on forests and fisheries more than eight millions; and from the sale of gunpowder, about two and a quarter millions. The sum of over forty-five millions dollars accrues from the sale of tobacco alone. For the administration and collection of the revenue she actually pays nearly forty million dollars.

FEMALE LABOR.—In Italy about one third of the whole number of laborers engaged in agricultural pursuits are women. In her manufactories 1,692,740 females and 1,379,605 males find employment. Out of 531,435 artists, nearly one fourth are women. There are 257,497 female landed proprietors there, and 313,497 maid servants. In France nearly one half the labor of almost all kinds is performed by females.

THE PANAMA RAILWAY.—Since the construction of this road across the Isthmus it has carried nearly 400,000 passengers and $675,000,000 of treasure, the latter from the Pacific to the Atlantic side of the isthmus. The silver shipments over the road are gradually declining, and most of the silver transported is shipped to the isthmus from the Pacific coast of South America. Of freight, the road has transported 614,535 tuns, but this year it is estimated the traffic will amount to 150,000 tuns. America now controls the road, which runs through the territory of New Granada, but England is making great exertions to get possession of it.

SINCE 1837 there have been established throughout the world 160,000 miles of telegraph lines, comprising 400,000 miles of wire, and working through nearly 14,000 stations. The total length of submarine cables laid is 19,923 miles. The price of telegraphing is higher in the United States than in England.

THE CONTINENTAL HOTEL at Long Branch, is 700 feet long. A continuous piazza fronting the ocean extends its whole length.

IT is calculated that 64,000 persons wear decorations of the Legion of Honor. A great legion, but no remarkable honor.

Recent American and Foreign Patents.

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

BRICK KILN.—Andrew S. McBride, St. Louis, Mo.—This invention relates to a new and improved brick kiln, so constructed that either coal or wood may be used as a fuel, and by it a great saving in fuel is effected and the bricks burned in much less time than hitherto. The invention consists in having the kiln constructed with a series of fire chambers at each side extending its whole length, with the smoke stacks at each end, and having the top of the kiln constructed of a series of dampers or adjustable slats, whereby the advantages above described are obtained.

GANG PLOW.—Robert R. Graves, Montgomery, Ala. Patented July 9th, 1867.—In this invention the dip of the plow is regulated, and means are provided by which upon encountering an obstacle the plow may be withdrawn without backing the team.

BROOM HEAD.—Lewis Allen, Berkley Springs, West Va. Patent dated July 9th.—The socket of the broom head is made of leather, pierced for the passage of the sewing twine and with a confining band, also pierced and retained on the socket by grooves in the latter.

SAWING MACHINE.—James R. Logan, Bellmere, Ind.—This invention relates to a cross-cut sawing machine and consists in a peculiar construction of the carriage on which the machine is mounted, whereby the frame of the machine may be retained in a horizontal position when placed on uneven or inclined ground. The improvement also consists in a modification of the construction of the standard or support to which the saw bar is attached when sawing felled timber; and, further, in the employment or use of a peculiar saw guide.

STEERING APPARATUS.—Thomas W. Murray, New York City.—This invention relates to a steering apparatus to be applied to the head of the rudder post of a vessel, whereby a very compact, simple and powerful mechanism is obtained for the purpose.

STRIPPING HIDES FROM BEEVES AND OTHER ANIMALS.—Christopher Brühl, Greenpoint, N. Y.—This invention relates to a useful machine for stripping hides from beeves and other animals, it being designed to supersede the manual prosecution of such work which is now clumsily practised at a considerable expenditure of time and labor.

RAKING ATTACHMENT FOR REAPERS.—John C. Hall, Monroe, Wis.—This invention has for its object to furnish an improved self-raking attachment for reapers which shall be so constructed and arranged as to imitate the natural movements in raking the grain from the reaper by hand.

MANUFACTURE OF BONE HANDLES FOR PARASOLS, CANES, ETC.—Joseph Harvey, Philadelphia, Pa.—Bone has long been used as a material for the manufacture of parasol, umbrella, and other handles, but it is not employed as extensively as it would be, provided sufficient stock could be obtained of proper size. This invention is to obviate this difficulty; it consists in constructing a bone handle of pieces connected together in a novel and very secure manner which will admit of a handle of the largest required size being made for various articles, including those enumerated.

GOVERNOR AND STOP MOTION.—F. J. Nutz and Philip Ester, Leavenworth Kansas.—This invention consists in an arrangement whereby the ordinary centrifugal governor is controled in its action and assisted to perform its proper functions as a regulator of motion, and also in a device for instantly closing the valve and stopping the engine in case of accident.

LADDER.—Benjamin F. Turner, Bridgeton, N. J.—This invention relates an improvement in ladders, for connecting several short lengths of separate ladders, in such manner that they may be readily and safely extended to be used as one long ladder, for a high elevation, or may be doubled upon each other to be used as a scaffold, or as a stage ladder, and thus be employed for various useful purposes.

LAMP BURNER.—William Robinson, Funkville, Pa.—This invention relates to an improvement in the construction of lamp burners and consists in making the cone or deflector movable by raising and lowering it within the outer perforated frame or case of the burner, to set the top nearer or further from the top of the wick tube.

COATING IRON AND STEEL WITH CAST IRON.—James Rigg, Iowa Falls, Iowa.—This invention relates to a method of producing a hard surface on iron and steel, and it consists in coating the said metals with cast iron, thereby producing a surface hard as the hardest steel, and which is susceptible of a high polish.

LATHE TOOL.—John C. Shackelton, Lawrence, Mass.—This invention relates to the manner in which a turning tool for lathes, in iron turning, is constructed and secured to the shank or tool holder, and it consists in forming the shank with a head in such a manner that the cutting tool is firmly secured to it and made adjustable by screws.

MOP WRINGER.—A. G. Starkweather, Burlington, Vt.—This invention has for its object to furnish a neat, simple, and cheap device by means of which mops may be wrung without its being necessary to take hold of the mop with the hands.

ANIMAL TRAP.—L. V. Badger, Chicago, Ill.—This invention has for its object to furnish an improved rat trap, simple in construction, not liable to to get out of order, and reliable in operation, and one which the rat, by escaping into the cage, will again set.

COTTON GIN.—A. Fessenden, Beaufort, S. C.—This invention relates to a cotton gin of that class in which the cotton is taken from a stationary platform and is carried between two rollers, which are so close together that the seed cannot pass through between them. The invention consists in the device for hanging the lower roller and adjusting it in the proper position. Also, in connection therewith, in an adjustable feed platform. Finally, in the shape of a self-adjusting seed-clipper or knife, and in the manner of hanging the same, so that it will assist in separating the seed from the fibers before the cotton comes to the rollers.

SPRING-BED BOTTOM AND BEDSTEAD.—E. Kreighoff, Rochester, N. Y.—This invention relates to a flexible spring mattress or bed bottom, which is so arranged that it can be easily removed or replaced when desired. When to be used as a bed bottom, the device is combined with a bedstead, which can also be easily taken to pieces, and to which it is secured in a novel and practical manner.

WOOD SCREW.—H. A. Harvey, New York City.—The object of this invention is to construct the head of a gimlet-pointed wood screw of a globular or spheroidal form, and to provide for driving it without cutting the ordinary nick across its face.

SPICE MILL.—H. W. Oliver, New Haven, Ct.—This invention relates to a new arrangement for keeping and grinding spices of various kinds, and the invention consists in combining and arranging a number of tubes or cylinders in such a manner that while the tubes severally contain different kinds of spices, either one may be ground separately from the rest.

MACHINERY FOR MAKING BUTT HINGES.—Adrian Rais, Waterbury, Ct.—This invention relates to improvements in machinery for the manufacture of butt hinges, and consists in mechanism so constructed and arranged that the two match blanks of a hinge are conveyed by automatic devices from two feed boxes or hoppers to the dies for bending the knuckles, thence to the milling wheels or disks, and thence to a central point where the leaves of the two match blanks are joined or interlocked, when another automatic device inserts the nail or rivet and the butt hinge is finished and discharged.

WATER ELEVATOR.—Samuel C. Lewis, Woodbridge, Mich.—This invention has for its object to furnish an improved apparatus for drawing water from wells, cisterns, etc.

GATE.—Ebenezer Young, Camden Center, Mich.—This invention has for its object to furnish an improved gate so constructed and arranged that it may be raised and will remain suspended so as to swing over snow or other obstructions, and so that its forward end may be lowered to rest upon the ground and hold the gate stationary in any position in which it may be placed.

AXES AND HATCHETS.—Daniel W. Callum, Laoni, Ill.—This invention relates to an improved form of ax, and consists in giving the edge a semi-circular shape.

RAT TRAP.—George Irwin, Elizabethtown, Ky.—This invention has for its object to furnish an improved rat trap so constructed and arranged that the caught rat, by locking himself in the inner apartment, will again set the trap.

WASHER AND WRINGER.—Wm. Bicknell, Hartford, Me.—This invention relates to a machine for washing and wringing clothes, and consists in the use of a tub in which a perforated reciprocating dasher is arranged, the removable cover of which is fluted on the under side, so that the clothes in the tub can be pressed between the dasher and the cover and are then submerged in water, and pressed again, until they are perfectly clean. They can then be wrung by pressing them between the dasher and the cover, and securing the former in place, gradually increasing the pressure until the water is removed from the clothes. The cover can be removed if desired, and can be used as a wash board.

WASHING MACHINE—Samuel Brackett, Port Huron, Mich.—This invention relates to a washing machine in which a flexible concave is so arranged in a box, around a revolving cylinder, that it can be closed completely around the said roller, thereby forming a cylinder of friction rollers around the clothes. The latter are secured upon the cylinder and revolve with the same within the flexible cylinder.

CARPET STRETCHER.—William W. Taylor, Newark, N. J.—This invention has for its object to furnish an improved instrument by means of which a carpet may be stretched upon the floor and held in place while the nails are being applied.

TUG TRIMMER.—Albert V. Hill, Limestone, N. Y.—This invention has for its object to furnish an improved instrument by means of which the edges of a tug may be conveniently, accurately, and quickly trimmed.

CLOTHES DRYER.—Henry Gransden, Dubuque, Iowa.—This invention consists in arranging arms upon an upright pole, in such a manner that while the arms are securely attached to the pole, and the cord or rope upon which the clothes are hung are attached to the arms, the whole may be securely folded up.

PETROLEUM FILTER.—J. Henry Smith, Pittsburg, Pa.—This invention relates to a method of filtering and purifying petroleum, and it consists in passing it through filtering pans containing proper filtering materials.

CAR COUPLING.—James Depeu, Peekskill, N. Y.—This invention relates to a self-operating car coupling, in which a link is used that is made in shape of a strong bar, having a head at each end. This head, when inserted in the coupling box, raises the hook-shaped front end of a pivoted bar, which as soon as the head has passed under the hooks, drops down over the head and locks the same between the inner end of the hook and a stop that is provided in the coupling box. For uncoupling the link, the front end of the hooked bar must be raised, which can be done in various ways.

BURGLAR ALARM GUN.—John Wilson, Anderson Court House, S. C.—This invention relates to a burglar alarm that consists of a swiveled horizontal gun barrel, so arranged on a frame that the said barrel can revolve on its vertical support. Suitable stops are arranged around the barrel, which are connected with wires that are spread across the room in which the apparatus stands, so that when a burglar or other party not acquainted with the arrangement of the wires, comes in contact with one of the same, the stop which holds the shot will be released, and the gun will swing around and strike against a stop, and point towards the direction in which the wire is stretched, whereby it will be discharged.

SPRING BEDS, SEATS, AND COUCHES.—Dwight Babcock, Seneca Falls, N. Y. This invention relates to a new manner of securing the upper slat of a spring bed bottom, seat, or couch to the spiral springs, and consists in the use of a ribbon which is laid across the slats, above a row of springs, and which is passed under the upper winding of each spring, thereby connecting and securely uniting the slats to the springs without the use of other fastenings or devices.

APPARATUS FOR DRYING LUMBER.—Richard P. Johnson, Wabash Ind.—This invention relates to an apparatus wherein wood of any description, whether sawed or split into lumber or not, may be steamed and dried, so as to be thoroughly seasoned.

LATHE FOR TURNING WAGON AXLES.—J. E. Cromwell, Jackson, Mich.—This invention relates to a machine for turning wagon axles, or the arms of axles that run in the wheel, and consists in the combination of saws and cutters that work in conjunction with each other in forming and giving the proper shape to the arm of the axle. It also consists in the novel arrangement of the feed works, which operate against a pattern which is duplicated by the machine in the most accurate and precise manner.

CREAM STRAINER.—George J. Bennett, Homer, N. Y.—This invention relates to a cream strainer, which consists of a cylindrical vessel with concave bottom, in which a seive or strainer is secured in such a manner that it can be easily removed or put on. A disk, having inclined wings similar to those of a screw propeller, is suspended directly above the strainer from a vertical shaft, and forces the cream through the meshes of the strainer when the shaft is revolved by a crank or other suitable device. Below the strainer is secured to the bottom of the vessel an inverted funnel, which protects the strainer and directs the flow of the cream after the same has been forced through the strainer.

DOOR HOLDER.—Edmumd Huddart, Prairie du Sac, Wis.—This invention consists in the construction and arrangement of parts of a door holder, in such a manner that one portion being attached to a door and the other part to the wall, the door may be held open, and in one position by friction.

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 50 cents a line, under the head of "Business and Personal."

J. N. H., of Pa.—We think you will find pitch to be a suitable cement for your aquarium having the ground as a bottom, and sides of wood.

W. J. A., of Pa., suggests that instead of graduating the arcs of surveying and mathematical instruments on a flat surface, that the degrees minutes and seconds be determined by a train of gearing which shall be set in operation by the movable part of the instrument. The reading may be exhibited on a dial plate resembling a clock face or otherwise.

J. C. G., of Kansas.—You can procure Smee's and Napier's Electro-Metalurgy of J. Wiley and Son of this city. The cost of Smee's battery of a size suitable for electro-metallurgy, is about $5 per cup. You can procure an outfit of apparatus and materials of Butler & Smith, Broome street, this city.

F. H., of C. W.—Magnetic iron ore is found in great abundance in America. But specimens which have strong polarity are quite rare. Artificial magnets are easily made of greater power than natural magnets, and the latter (loadstones), are now only objects of curiosity for a museum or a mineralogical cabinet. For information on magnetism consult Ganot's or Silliman's Physics.

H. T. B., of Iowa.—"What is the best way to melt india-rubber, also where can I procure some of the pure gum?" India-rubber may be melted in a metallic or earthen vessel, and the care to be taken is that the heat be applied gradually and slowly It melts at about 248°. On cooling, however, it does not resume its original condition but remains in a semi-fluid adhesive state. Raw rubber can be procured at any of the rubber factories, and at some of the rubber stores in this city.

E. P., of Pa.—"The papers say that if his invention is perfected, it will revolutionize all previous systems." There's the rub, the success of the project depends upon its perfection. If our dreams were realities we might all be kings. We know nothing of the invention to which you allude.

N. K. S., of Vt.—For japanning, use the best quality of copal varnish.

A. T., of N. Y., is arguing with a friend who contends that the earth is not round like a ball but flat like a mill stone. A. T. seems to have been handled roughly and appeals to us for assistance. It is a pretty quarrel as it stands and we prefer not to interfere. But as some encouragement to hold on, we remind him that at last the truth is apt to prevail.

R. N. D., of O.—Chalk has not yet been found in America. It is imported from England, mostly as ballast.

R G. D., of Mo.—Carbolic acid is now extensively used here as a disinfectant, and is approved by the board of health and by the medical profession.

R. V. W., of R. I.—Alkali is an essential ingredient of soap, and we think, you are wasting your time in looking for a substitute for it.

E. W. N., of Mass.—We recommend you to get "The Draftsman's Book," published by H. C. Baird. 406 Walnut street, Philadelphia. You should procure other books in proportion to your means and to the extent you desire to pursue the subject.

T. L., of Mo.—The pressure on the pipe leading water from the pump into a boiler is greater than the pressure in the boiler. Otherwise no water would pass through into the boiler.

W. P. M., of Ill.—"We have a saw mill here (Ulin) owned by J. Bell which sawed on the 26th of June 42 poplar logs making 40,807 feet, square face, parallel inch boards by one double circular saw in 10 hours and 8 minutes." Mr. Bell appears to be the "top sawyer" of the Continent.

J. H. McC., of Ill., sends a recipe for a cement which he finds useful for vulcanized rubber or "anything else." Take best glue 4 oz., isinglass, 2 oz. and dissolve in mild ale, in a glue kettle, to the consistency of thin glue. Then stir in half oz., well boiled linseed oil. When cold it resembles india-rubber. It may be preserved in the form of cakes. When used it is to be dissolved in a suitable quantity of oil. It is an excellent cement for leather earthen ware, etc.

J. R., of N. Y., made a solution of chloride of silver in cyanide of potassium to which he added whiting. The mixture was put into two bottles, when shortly in one bottle it became reddish, while in the other it was not changed. The case is not extraordinary. Cyanide of potassium is a very powerful solvent of organic and metallic compounds, and the foreign matter to produce the color was introduced by some accident such as a dirty bottle or cork, etc.

J. B., of Iowa.—It is very doubtful if any of the processes of preserving wood by means of metallic salts are practicable for shingles in this country. The creosoting process (treatment with dead oil or coal tar) is however, economical and cheap. The strongest objection to it is that the wood is rendered more combustible.

D. S. C., of Mo.—A practical lithographer of this city says he is unable to give an opinion of the value of lithographic stone except an actual trial, and the sample you send is too small for the purpose. The appearance of the sample is favorable.

F. G. S., of Mass.—Your plan of measuring the curvature of the earth is correct and ingenious. The angle formed by plumb lines erected at the short distances from each other is so small that it cannot be determined with desirable accuracy.

A. G. C., of N. Y.—We are not aware that an ink is on sale, which fades completely in a short time after it has been used in writing with. It would not be very difficult, however to make such an ink.

J. Mc., of Ct., R. A. D., of Wis., page 7 says, people out there claim that a raft of lumber will travel faster than the current, etc. I know the people who say so, are right. The surface of a running stream is an inclined plane, and heavy bodies floating on its surface slide down the incline, and the heavier of two rafts will drift the faster. I am an old boatman and raftsman." The most rapid part of the current is generally in the middle of the stream, and if the raft be in it, the raft will travel faster than the current at its sides. Also it often happens that the current is a little swifter just below the surface, and for this reason a heavy body might float more rapidly than one which did not sink below the surface

W. P., of N. Y., has been told that a perfect sphere when elevated high in the air appears to the eye an oblate spheroid, and that the balls to be placed on steeples, etc., are consequently made of a prolate form to compensate for the optical illusion. . . . Mercury is a solvent for brass, and hence when rubbed on a brass wire, the wire becomes brittle. Observe how a lump of sugar becomes softer when wetted.

S. L. G. F., of Mass.—The sterility of land in a well watered tropical region is generally due to the impregnation of the soil with sulphate of copper or iron. . . . Coal is always associated with certain geological strata which are so disposed that they form a basin for the coal deposit. A knowledge of these facts is very important in making explorations for coal. . . . Mica is injurious to fire clay, and you will fail to make the best quality of fine bricks.

T. H. W., of N. Y.—For a given head and supply of water the larger the water wheel the better.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Machines for Rossing Oak Tan Bark. Send maker's address with description and price to Hamilton & Cunningham, Nashville, Tenn.

Manufacturers of Galvanized Wire Cloth and Hoop Iron, please send address to Box 60, Georgetown, D. C.

M. R. S., of Mo. The crystals of a metallic appearance in the mineral you have sent are sulphide of iron.

A. B. is informed that Olmsted's Spring-top Oilers are superior to any other in the market. Sold everywhere.

Wanted—A purchaser of my patent-right clothes bars and wardrobe hook for the New England States, the best of the kind ever made. Address M. D. Hotchkiss, Sheboygan Falls, Wis.

Wanted—Circulars and terms of manufacturers and dealers in sewing machines. Circulars and terms of dealers in useful inventions and novelties. Address of parties who manufacture small patent articles. W. Clare Anderson, Agent, St Louis, Mo.

Manufacturers of Peat Charcoal send their address to C. Browning, Rush Run, Ohio.

Wanted—Address of Toy Manufacturers. Address Lock Box 23, Des Moines, Iowa.

Wanted—Best Clover Seed Gatherer. Manufacturers send circular and price list to Gillespie, Watkins & Co., Chattanooga, Hamilton county, East Tennessee.

EXTENSION NOTICES.

Ephraim L. Pratt, of Boston, Mass., having petitioned for the extension of a patent granted to him the 4th day of October, 1853, for an improvement in machines for paring apples, for seven years from the expiration of said patent, which takes place on the 4th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

Harvey Lull, of Hoboken, N. J., having petitioned for the extension of a patent granted to him the 31st day of January, 1854, and antedated January 2, 1854, for an improvement in shutter hinges, for seven years from the expiration of said patent, which takes place on the 2d day of January, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

Joshua Gibbs, of Canton, Ohio, having petitioned for the extension of a patent granted to him the 4th day of October, 1853, for an improvement in machine for grinding plow castings, for seven years from the expiration of said patent, which takes place on the 4th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

PATENT OFFICE DECISIONS.—WHAT CONSTITUTES A PATENTABLE CONBINATION.

Elisha Foote for the Board of Appeals.

IMPROVEMENT IN FEEDING MILLSTONES.—The apparatus which the applicant claims to have improved is attached to grinding mills, and operates between the hopper or feed and the eye of the mill stone to blow out dirt and other impurities from the grain on its passage from the former to the latter. The applicant has changed the general structure of the apparatus, for which he claims many advantages, and has also added to it a new feature—that of separating and saving the light grain, cheat, and cockle, which before was blown off with the dirt. The first claim is for the separator, constructed and operating substantially in the manner described, and applied in the relation to the feeder and the eye of the stone, substantially as shown.

The reasons assigned by the Examiner for rejecting this claim are, that the combination claimed is not a valid one; that the "separator and feeder perform separate and distinct offices; and are not co-active in a legal sense;" that "if the action of the feeder depended upon the separator, or the separator upon the feeder, for a common result, such a condition of circumstances would change the action of the office, but the two devices act in succession and not together, and the two clauses of claim cannot be considered as in connection with the feed devices of a grinding mill."

We do not agree with the Examiner in respect to these grounds on which he has rejected the application. We do not regard it as essential that the several parts of a new combination shall act simultaneously, or that one part shall be dependent for its act on upon another. But, on the contrary, we hold that it is no objection that the separator and feeder perform separate and distinct offices; that the feeder does not depend upon the separator or the separator upon the feeder, and that the two devices act in succession and not together.

In the card-making machine, for example, one part draws the wire into the machine, another cuts it off, another bends it into proper shape, another punches the leather, another moves the carriage, etc. The whole is a combination of unsurpassed ingenuity. It was no objection to the patent that the different parts operated in succession and not together, and that one performed its offices without aid or dependence on the rest. It was enough that all contributed to a common result. In the present case, so long as the feeder and separator contribute to the purpose intended—the manufacture of flour—it matters not in what way they act, whether together or in succession, or whether dependently or independently.

There is no peculiarity in patent laws relating to combinations. Claims for them should be examined upon the same principles that apply to other inventions. In all there must be found invention and new and useful results. Mere aggregations of parts without invention to combine them—substitutions of merely equivalent devices for others—mechanical changes merely and variations of form, proportions, or arrangements, without new and improved results, do not consititute patentable combinations. It has been said that the several parts must be co-active—that means that the addition of something that is useless or does not co-operate in producing an improved result, will not be patentable.

But when invention has been brought into exercise to add a new feature to a machine, or to produce old results in a better or cheaper manner, we are not aware that patent laws impose any limitation as to the order or particular manner in which the several parts shall operate to produce the new results obtained.

The Examiner's decision is consequently overruled.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,395.—SELF-ACTING AND VENTILATING FEED BAG FOR HORSES.—Nathanie Knight, Auburn, Me. May 11, 1867.

1,440.—BILLIARD TABLE.—Hugh W. Collender, New York City. May

1,475.—TRUSS.—Wm. Pomeroy, New York City. May 18, 1867.

1,491.—INSTRUMENT FOR SHARPENING CUTLERY.—James Meyer, New York City. May 20, 1867.

1,499.—REAPING AND MOWING MACHINES.—Walter A. Wood, Hoosic Falls N. Y. May 20, 1867.

1,547.—STEAM GENERATOR.—Richard J. Nunn, Savannah, Ga. May 24, 186

1,551.—EMBROIDERING APPARATUS FOR SEWING MACHINES.—Louis Morris New York City. May 24, 1867.

1,697.—PROPELLER FOR STEAMSHIPS AND OTHER VESSELS.—Henry Rolle Boston, Mass June 8, 1867.

1,717.—APPARATUS FOR ELEVATING, WEIGHING, AND MOVING GRAIN.—Stephen W. Wood, Cornwall, N. Y. June 11, 1867.

THE "PUBLIC LEDGER" BUILDING.

No more decisive exhibitions, or rather demonstrations, of our progress are to be found than in the great improvement in the style and character of our buildings for the uses of the public, whether those buildings are intended for public charities or for public benefit through private enterprise.

Among this latter class we reckon the edifices for the production of the daily mental *pabulum* of the people. None are of better agreeable exterior or of more satisfactory and convenient interior than the magnificent edifice belonging to the *Public Ledger* of Philadelphia.

We made a brief notice a short time ago of the opening of this new establishment, but we present our readers, this week, with a view of its external appearance, and a description of its principal internal arrangements.



VIEW OF THE "PUBLIC LEDGER" BUILDING, PHILADELPHIA.

The building presents a splendid brown stone structure, 84 feet on Chestnut street, and 165 on Sixth, five stories in hight, with a Mansard roof as the finishing ornament. The architectural plan of the original building at the corner was followed in the additions, so far as outward appearances are concerned, thus giving to each story above the first a series of brown stone piers or pilasters to mark the divisions between the windows. Between each story the ornamentation in stone is simple and chaste, consisting of arches over the heads of the windows, with carved keystones and cornice, frieze and architrave as a relief to what might otherwise be the monotony of 116 windows above the first story on Sixth street, and 56 windows on Chestnut, or 172 windows on the two fronts. In the middle of the Sixth street front there is a slight projection, running the hight of the elevation. This tends still further to vary the architectural design. The first story is composed of heavy wrought-iron columns, supporting the stonework above. On the base a ribbon contains the inscription, *Public Ledger*, and also the monogram, "G. W. C." The whole design is exceedingly bold, and has been executed with skill and taste.

In addition to this ornament, the corner of Sixth and Chestnut streets contains a still more striking figure. Upon a stone column, two feet six inches in diameter, and eighteen feet in hight, set against the angle of the building, stands the statue of Franklin, cut from Pictou stone. The figure is ten feet six inches in hight, and is not only perfect in its details, but the face is the best likeness of the philosopher ever carved in stone. While Bailey, the artist, was engaged in modeling the figure, he received from the late Mr. William J. Duane a portrait of Franklin, painted in Paris, by Duplaisse, the celebrated miniature portrait painter. This is the best portrait of Franklin in existence. The figure stands erect, the left hand resting upon a pedestal formed by a pile of books to the left and rear of the statue. The right arm is elevated, and the hand grasps the lightning rod, while resting against the books is the traditional kite. The figure is clothed with the costume so familiar to us in the engravings of Franklin. The column upon which the statue stands is handsomely fluted, and has an ornate cap, around the neck of which is inscribed, "1866. *Public Ledger*. 1866." The face of the column will contain the bulletin board. As it stands, the top of the statue reaches to the third story floor, and an arrangement of gas is made, by means of which, at night, the four prongs of the lightning rod will emit flame.

The addition of the Mansard roof greatly increases the architectural effect of the whole structure. Without this roof the building has an elevation of sixty feet from the pavement to the elaborate cornice. This roof is rendered still more attractive by being arranged with domes at the corners fifteen feet in hight, from cornice, while the central elevation on Sixth street is a dome twenty-one feet in hight. The other portions of the roof are twelve feet above the cornice.

The Publication Office on the first floor, at the corner, measures twenty-three feet on Chestnut, by sixty-five feet on Sixth, and fifteen feet ten inches from floor to ceiling. The room is a marvel of delicate joinery work, and is one entire mass of dark walnut and buttonwood, or, as it is sometimes called, white walnut. Instead of plaster the sides and ceiling are wainscoted with these costly woods, while the counters, fixtures, furniture and general appointments are made to correspond in every respect with the elaborate design of the architect.

The labor and skill required in the construction of this magnificent office may be imagined when we state that there are nearly 4,000 pieces of wood of various shapes and sizes in the wainscoting, all fitted and joined together with the nicety and exactness of the most elaborate article of cabinet-ware.

The floor in front of the counter, as well as the floor of the Waiting Room, is laid with black and white marble tile in blocks. The contrast with the dark wood of the office is very fine. Heating apparatus has been introduced in the shape of coils of pipe inclosed in bronzed open-work iron stands, upon the top of which are white marble slabs. The result of this arrangement is, that instead of being in anywise an obstruction, they are rather an ornament to the room. In order to facilitate the transaction of business, a "dumb waiter" for "copy" is set in the side wall and leads to the third and fifth stories, the former being the editorial and the latter the composing rooms. Speaking tubes also communicate with the various apartments, 568 feet of tube being used throughout the building for this purpose.

The central dome on the top of the building is an observatory. From it a grand view of the city is obtained. A panorama of rare beauty passes before the vision of the spectator. East, west, north and south, for miles, every object of interest in Philadelphia is clearly discernible. Southward, the line of the Delaware and Schuylkill is distinctly marked until near the union of the two streams at League Island. Point Breeze Gas Works, the Alms House, County Prison, as well as hundreds of factories and founderies, are in view. North, Girard College, Fairmount Park, the Cathedral, and scores of prominent buildings are in plain sight. East, we have the Delaware with its shipping; and west, Mantua, and the whole region known as West Philadelphia. This "look-out" promises to be an attractive spot for those who wish to secure a bird's-eye view of Philadelphia, and in order to accommodate visitors, seats have been arranged around the flag staff. The whole is probably one of the best if not the best publication offices in this country, the basis of which is the establishment of a daily newspaper, that book for the million, at two cents a copy.

TO EDITORS AND PUBLISHERS---ENGRAVINGS FOR SALE.

The large engravings of Railroad Bridges, the iron ship *Dunderberg*, Greenwood Entrance, and many other of these large ones which appeared in the SCIENTIFIC AMERICAN during the last year, may be had on reasonable terms—for less than half their cost to engrave—upon application to the publishers of this paper.

Squeaking Boots.

C. N. M. says that the unpleasant squeak of boot and shoe soles can be stopped by simply confining the layers of the sole by one or more rows of pegs, driven from the toe toward the heel, as the noise is caused wholly by the friction of one sole on the other. The only objection is that the rows of pegs unpleasantly stiffen the soles.

SLADE, our foreign correspondent, calls our attention to one or two singular statements made in his published letters, for which he is not to be held responsable. In speaking of the Austrian locomotive *Steyerdorf* (page 334 Vol. XVI,) its weight was given as four and a half tuns instead of forty-one and a half, as it should have been. Again, in describing the Walschaerts valve gear, it was stated that "the lead of the valve will be varied by shifting the radius rod in the link;" the reverse of this is of course true, the error in this case being caused by the omission of a line of the copy.

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

☞ 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 on them will be promptly attended to.

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VOL. XVII., No. 4....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, JULY 27, 1867.

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NOTICE TO SUBSCRIBERS.

Those subscribers who wish to preserve the volume of the SCIENTIFIC AMERICAN just closed, can be supplied gratuituously with an illustrated title page and index, to bind with the sheets, on application at this office either in person or by mail, or through any dealers who supply the paper.

BINDING.—Subscribers wishing their volumes of the SCIENTIFIC AMERICAN bound can have them neatly done at this office. Price $1.50.

THE TRADES UNION ATROCITIES IN SHEFFIELD.

The cause of labor combinations in the form of trades unions must receive a severe shock from the revelations lately made in England before a Parliamentary commission. Although the crimes were committed by individual members without the sanction of the associations—at least this may be charitably supposed—yet it will be difficult to disabuse the public mind of a prejudice against the combinations which make these crimes possible.

For years a system of tyranny has been steadily pursued by some of the workingmen's organizations toward those who refused to associate themselves with the unions. If workmen, their tools were stolen, their tenements burned or blown up with gunpowder, all sorts of tricks were played with their work, and they themselves were brutally beaten and even murdered by hired assassins. If employers, their machinery was destroyed by midnight burglars, their shops, and factories burned or blown up, their workmen intimidated, and their persons brutally maltreated. At last, the local authorities being powerless to put a stop to these outrages, either from sympathy with the perpetrators or from the terrorism which seemed to have taken the place of law, a commission was appointed by Parliament to investigate the matter, and by promising immunity from punishment to the perpetrators on confession, it has succeeded in drawing forth the details of crimes as revolting and tyranny as absolute as that of Al Hassan, the "Old Man of the Mountain." Except for these confessions of the villains, themselves, it would be impossible to believe these tales of horror.

In this case the directing and presiding Thug was one Broadhead, secretary of the Saw Grinders Union, and Treasurer of a national association of trades whose members number over 60,000. The confession of this Broadhead and two of his tools show that he paid them out of the funds of the societies whose affairs he managed, ten pounds for blowing up a house or shop and fifteen pounds for maiming or murdering an obnoxious person. After the deed was perpetrated he would offer rewards for the detection of the criminals, and denounce the atrocity in public meeting. One man named Linley was murdered by Broadhead's assasins for the sum of seven pounds ten shillings each, two being employed. Broadhead states that he committed the crimes with "great regret!" One of his victims was pounded until almost dead, another crippled for life, another killed outright. Seven houses and factories he caused to be blown up, among which was the dwelling of a butcher whose offense was that he harbored a relative who was obxoxious to Broadhead.

The effect of these revelations will probably be to destroy sympathy for the workingmen who combine in unions, and either to suppress the associations by law or by the indignation of the people. It is difficult to believe that the associations for which Broadhead acted were entirely unaware of the uses to which their money was applied, for the crime of tool stealing appears to have been very generally prevalent, and the falsification of Broadhead's accounts seem not to have instigated any investigation. He states explicitly that the secretaries of two associations gave him money for the perpetration of his crimes. How far, however, his statement about others is worthy belief is a matter on which the reader must form his own opinion.

It would be hardly fair to denounce all labor combinations because some of their members behave like fiends. There is little doubt that these crimes were the offspring of ignorance and low moral sense, rather than of association. Intellectual, and especially moral education of the members is the only safeguard of the public and preventive of organized and systematized crime.

THE EARTH BECOMING TOO SMALL FOR THE HUMAN FAMILY.

It was formerly a common practice to estimate geographical distances by the time required to travel over them. The expression, "day's journey" occurs many times in the bible and in other books translated out of the ancient tongues. This measure of distance was a very convenient one and was sufficiently exact for ordinary purposes, for it was based on many centuries of the experience of mankind in traveling. The time consumed is generally the most important incident of a journey. This word journey, by the way, originally meant only the distance traveled in a day, and it held this meaning, until modern improvements in locomotion made it indefinite. A day's journey was equivalent to a distance of twenty to thirty miles.

The facilities for travel determine the extension of commerce and civilization. Where modes of travel are easy and rapid, more people can live, and can live in greater comfort. By reason of the improvements in locomotion made during the present century, it might be shown that the earth to day is capable of supporting twice as many people as formerly.

Instead of going only 20 or 30 miles in a day over a hard and dangerous road, we glide over 300 miles by sea, and 600 by land. We travel about twenty times faster than our grandfathers; our day's journey has increased in length twenty times, and at the same time it is cheaper and safer. Because travel is more rapid, cheap, and safe, every one now is on the move. Distances are practically so lessened that it is to be feared that the earth will turn out to be a narrow stamping ground for the human family. All the nations have become neighbors. We hold world's fairs and conventions; we hope shortly to have a universal system of coinage and weights and measures, and perhaps a universal language. There is to be a metropolis of the world where all tribes of men shall be represented: will it be Paris or shall we build it in America? The tendency is to bring all to a level, but it is a level whose plane is far above any former and local civilization. There is to be a universal community of interests and thus a practical community in property.

TO THE PRESIDENT.

We respectfully call the attention of the President to the deplorable condition of the business of the Patent Office, asking that he will inquire into the mismanagement of the present Commissioner, and do something to relieve the genius of the country from the oppressive delays occasioned by official stupidity. We understand that there are between three and four thousand models of new applications now waiting examination at the Patent Office. The examinations in many of the most important classes of inventions are half a year, more or less, in arrears, and the interests of thousands of dependent inventors are allowed to suffer, without any steps being taken for their relief. The Patent Office was established expressly for the encouragement of inventors, but it is at present so mismanaged as greatly to discourage them.

Nothing can be more dreary or disheartening to the inventor than the delays of the Patent Office in deciding upon the novelty of the application. In many cases the entire private business of the inventor and his associates, are suspended until the decision is rendered. In other cases the delays of which we complain, occasion the ruin of the brightest prospects of the applicant.

If the President asks for an explanation from the Commissioner, the latter will make his usual stereotyped excuses and assurances,—want of room,—want of aid from the Secretary of Interior—most positive, most prolific promises of immediate, instantaneous reform. But we warn the President that unless he issues a peremptory order to have the work brought up, nothing will be done. The Commissioner seems to be incapable of doing anything of his own volition, except to make and break promises. He evidently needs a galvanic shock from his superior officer, and we hope the President will lose no time in administering the proper kind of electricity.

AIR GUNS NOT NOISELESS.

We find the following in *Harpers' Weekly* for July 13th:

Air guns have been known for more than a hundred years, yet they are rather appendages to the lecture room of the professor than for practical purposes. By the compressed air in a metallic ball, permitted to escape by the opening of a valve, ten, twenty, and possibly fifty balls may be discharged in a single minute with the deadly force of powder. The larger the volume of compressed air the greater the momentum of the bullet. A question has come up why such arms would not be of the highest importance in the time of war. Cannon might batter a fortress into powder, and ten regiments attack a fortified city with showers of balls without alarming the sentinels, because there is no report.

We regret to see a periodical like *Harpers' Weekly*, usually so accurate in its statements, aiding in the perpetuation of a popular error. It is not correct to say that the action of compressed air in an air gun has the "deadly force of powder." While air cannot be compressed by any mechanical means now used more than about forty times, giving a pressure per square inch of about six hundred pounds, the lowest estimate made of the force of exploding gunpowder is a pressure per square inch of about twenty thousand pounds. Neither is it true that the discharge of the air gun is noiseless. The shock of a suddenly liberated gas against the atmosphere is the cause of the noise of the explosion of gunpowder; it is not its combustion. So in an air gun, the liberation of the compressed air makes a report proportioned to the force of its action on the atmosphere. In the recent case of the shooting of Carr, in Brooklyn, by Skidmore, the officer who witnessed the affair testified to the sound of a dull explosion, and although the murderer was within a few feet of his victim the projectile merely entered the head, instead of passing through, as would most likely have been the case if gunpowder had been used.

It is erroneous to suppose that the air gun is noiseless. The only reason its explosion does not make so loud a report as that of gunpowder is because it has a proportionably less force.

THE NATURAL COLORS OF FIBROUS MATERIAL.

Although Nankin cotton was for many years a favorite material for thin goods, and the woven fabric was quite popular not only for its endurance but for its color, many people then and many now suppose the yellow tint of the cloth to be given by the art of the dyer. This is not so. The deep yellow, or rather the faint orange tint of the Nankin cotton is inherent in the natural product and the art of the dyer has nothing to do with it. This cotton is of the variety known to botanists as the *gossypium arborem*, or tree cotton, and is supposed to have originated in Persia. The fiber is remarkable for its length, strength, silkiness, and yellowish tinge. It grows luxuriantly in some parts of India and China, from the latter of which our importations of Nankin cotton were originally made. The Sea Island cotton of our Atlantic coast is a variety of this cotton, and greatly excels the *gossypium herbaceum*, or upland cotton, in length and strength of fiber, and differs from it in its color. This makes the strongest thread cotton in use, and as its yellowish tinge is much fainter than that grown in the East, chemical science has discovered a way to bleach it.

The color is generally considered to be due not to the climate but to the constituents of the soil, which must contain ferruginous oxides to give it the orange shade. Its length of fiber, and strength however, is due mainly to its species, as no upland or herbaceous variety ever equals it in this respect. The last generation was very partial to the Nankin cotton. At that time buckskin breeches, having a buff color, or cloths of a similar hue, were considered "the thing," and in summer the love of the color could be gratified by the substitution of the Nankin cotton as being lighter and almost as tenacious and durable. The changes of fashion, only, can be quoted as an adequate reason why the Nankin cotton should not now as then be popular as material for gentlemen's pantaloons and vests and ladies' dresses. Certainly no such cheap and agreeable material has as yet succeeded the Chinese product.

It seems as though nature was chary of her extremes in color. She produces but little material for our manufacture which is either pure white or unmitigated black. Our cotton, however nearly it approaches white, is still impure in shade, and the wool of the blackest sheep appears a dingy dark gray. To make them either the one or the other we must have resort to the sciences as practically applied. Even the white silk dresses of brides are colored. They are not of the natural tint. If so they would show an unsatisfactory tinge neither white nor positive yellow. When the silk, imported from southern Europe, or China, or Japan is received in this country, it has a dirty half yellow half orange shade which is not at all agreeable to the eye The blueish silvery luster which is seen in white silks and satins is produced wholly by the art of the dyer. It seems impossible to produce any vegetable material for textile manufacture which shall have a positive shade.

In animal products it is different. We can have perfectly black wool, also wool which is a perfect white. If it does not appear so when first sheared, thorough washing and cleaning by chemical means will make it rival the driven snow. No need of the art of the dyer here. Possibly, however, the time will come when by the advancement in the arts we may be able not only to give different colors to the vegetable products used in the manufacture of textile fabrics, but be able to bleach tinged material to a perfect snowy white.

TINNING RIVETS AND TACKS.

T. M. H., of Mass., desires to know how to coat tacks with tin. He says he has tried for a long time, but has not yet succeeded. The process is very simple, but some manufacturers make a great mystery of it and endeavor to keep it a secret. Rivets, tacks, and other small articles are tinned in the same manner. First, the tacks should be thoroughly cleaned. For this purpose dilute sulphuric acid is used, only strong enough to remove the grease and whatever scale there may be on the tacks. From the acid they are put into water and rinsed, then taken out and drained. While still damp, powdered salammoniac is sprinkled over them and they are ready to go into the bath. This is merely a cauldron of melted tin. Until the tacks are hot enough to "take" the tin they float on it, but soon as they sink they are ready to be removed. This is done with a perforated ladle or skimmer, and the operator throws the ladle-full of tacks violently against a a screen of sheet iron to loosen the excess of tin and prevent the tacks from being soldered together. From the screen they slide down inclined troughs of sheet iron long enough to insure the cooling of the tacks before they reach the bin.

These inclines must have considerable pitch so that the tacks cannot stop on the way and become glued to the trough.

This is the grand secret of tinning tacks. The acid cleans them and the salammoniac acts as a flux. All the tin that rattles off in the form of scales can be saved and remelted. The sale value of tacks tinned is increased about five cents a pound, and the cost is about two cents.

USES OF NUISANCES.

Few people can look with pleasure, or even complacency, on the reptile tribe, but they have their uses. The snail is a *bon bouche* to the French and others, and frogs or "water chickens" we know by trial to be delicious. The inhabitants of Central America delight in the flesh of the huge lizard, iguanodon, and even the musky flesh of the alligator is not obnoxious to them.

Years ago we knew of a lady, refined and cultivated, who ate with gusto the crawling bugs found under stones in moist places, called by the country people "sow-bugs," and declared they had a delightful acid taste. The French saying, *chacon a son gout*, is perfectly right. Every one to his taste. What is poison to one is nourishment to another; and we find in one of our exchanges a statement that the common angle worm when fed for a few weeks upon sugar is said to furnish a very delicate and delicious jelly, which is peculiarly acceptable to the stomachs of dyspeptics and consumptives.

We have no doubt of the truth of this statement. We have known this reptile used as a material for soup as well as for a poultice, applied outwardly and inwardly with apparently good results in certain cases of disease. Whether the cure was the consequence of the prescription, we are not physician enough to say, but that a cure did follow from this almost inhuman treatment, we know.

In fact, we have no better reason for rejecting the lowest of God's creatures as a means of our advantage, whether in health or sickness, than we have for denying our appetites the gratification of animal food altogether. At first sight the use of the reptile and insect tribe is unpleasant, but when we consider that from the earliest times whole tribes and nations have considered them legitimate articles of food or means of cure, we pretend to a nicety of taste not supported either by the practice of others of our race or by the Word of God if we reject them.

As we understand the purpose of the Creator, nothing was created in vain, and possibly while we have been trying to curb the elements, we have forgotten that the lowest orders of animal life may be made to minister to our wants and our necessities, if not to our love of change.

"Haloxylin"—New Blasting Powder.

The vast importance to the miner of a thoroughly good blasting powder, causes considerable interest to attach to all inventions relating to the manufacture of that article; especially when additional advantages are obtained without a corresponding increase in the cost of production. For some time past a new blasting compound—the novelty of which, however, consists rather in the mode of manipulating the materials than in the materials themselves—has been extensively used in the mines and quarries of the Austrian empire, under the name of haloxylin, which appears to have given great satisfaction, both from the quantity of work done and the manner of doing it. It is one of those powders which has the property of merely burning away when in the open air, and yet exerting a great rending force when properly confined in the blast hole; while it is not liable to ignite spontaneously, and cannot be exploded by percussion or friction. The smoke resulting from the explosion is less in volume than usual, and, in addition to this, it is free from the usual suffocating character of powder smoke; in fact, there is nothing in the residue injurious to health, or even disagreeable, so that operations can be carried on without intermission. A pound of haloxylin will occupy nearly twice the space of 1 lb. of gunpowder; and as it does fully two-thirds the amount of work, bulk for bulk, as any powder now in use, it follows that a material saving of cost is effected.

The invention of this powder is due to Messrs. Wilhelm and Ernst Fehleisen, of Styria; it consists of sawdust, charcoal, saltpeter, and usually, ferrocyanide of potassium, although the latter ingredient is sometimes dispensed with. The proportions in which they are combined are generally 9 parts by weight of sawdust, 3 to 5 parts of charcoal, 45 parts of saltpeter, and, 1 part of ferrocyanide of potassium. The sawdust, which if not from a non-resinous wood should have the resin extracted from it, is passed through a fine sieve, and then mixed with finely-powdered charcoal (from light woods) and powdered saltpeter. The mass is moistened with about a quart of water to the hundredweight, and then stamped or crushed. By this means the whole is rendered homogeneous. The mass is now moistened again with water under ordinary circumstances, and with a weak solution of ferrocyanide of potassium when a quick powder is required. The subsequent processes of caking, granulating, and drying are conducted in the same way as is usual in the manufacture of ordinary powder, and the grains can, if desired, be polished as usual, but this is found to be unnecessary.

Owing to the great cost of carrying explosive materials, the importation of haloxylin from Germany is, commercially, out of the question; it is, therefore, proposed to manufacture it in this country. There are at present three factories in Styria, Hungary, and Moravia respectively, yet they are scarcely able to keep pace with the continually increasing demand, and it is to this circumstances alone that is to be attributed the fact that until now, no efforts have been made to introduce it into England. The Hunyad board of the Kronstadt Mining and Smelting Company made careful comparative experiments in their Telek iron mines, and obtained with half the weight of haloxylin the same results as with the powder in ordinary use; but such a high duty as this probably resulted from some exceptional circumstances not having been taken into account; that 2 lbs. of haloxylin, however, will do as much as 3 lbs. of other blasting powder appears to have been well ascertained. The Austrian State Railway Company certify, as the result of the experiments made at their mines in the Banat, that the trials in the coal mines of Doman, took place in a cross course when very dense vapors prevailed; nevertheless, the place could be approached immediately after blasting, no smoke being left. As to the effect, 2 to 2¼ ozs. of haloxylin are equal to 3 to 3¼ ozs. of blasting powder. The result of the experiment with this substance showed that a firmer inclosing wall was required than with powder; the effect upon the rock was more cleaving than crushing, and on account of this property it promises considerable advantages over powder for the blasting of coal. In the ironstone mines of Morawieza the experiment was made in less firm rock, with large bores, and a charge of 25 to 30 lbs. of haloxylin produced an effect exceeding by one-third that of gunpowder. Such evidence as this is sufficient to prove that the non-explosive has, at least, some advantage over ordinary blasting powder; and when the quantity of blasting powder annually used in Great Britain is taken into consideration, it will be readily understood that, assuming even the smaller estimate 30 per cent of saving, the inducement for the miners of this country to adopt it will be ample to insure, under any circumstances, a fair remuneration to those undertaking the manufacture.—*London Mining Journal.*

English Artisans at the French Exhibition.

On Whit-Monday, as we learn from the London *Times*, the first batch of English artisans, about one hundred and fifty, went to see the French Exhibition. A little encampment of huts has been built close to the most frequented entrance of the Champ de Mars—namely the Porte Rapp—for the working classes, the huts are clean and comfortable. Some contain two beds and some four. More than one hundred of these beds have been engaged for the use of English artisans during the next five months; and during the present holidays a still larger number have been engaged. It is calculated that the trip to Paris will cost the British workmen about fifteen dollars, and for this sum he can stay there a week. The cost of transit to and fro absorbs half the money. There are kitchens all over Paris which provide the workingman with a cheap dinner, wonderfully good; and at the Omnibus Buffet, in the Champ de Mars, he can fare well at a very moderate charge. All the food in Paris is rigidly inspected. There are people there whose business it is to examine even the eggs that come into the market; so that the artisan can have no fear that he will have carrion or horseflesh or anything false offered to him. This omnibus restaurant is an immense place, with accommodations for fifteen hundred people to dine all at once. "The food is really good, and I doubt not says the *Times* correspondent, that the British workmen will enjoy the change and think it glorious. The only thing bad about the dinner is the cheap wine. The beer is very good, as they have not yet learned the art of adulterating it; but the British workman does not see the use of coming to Paris, if he is to drink beer."

Native India Muslins.

Whatever relates to textile fabrics, especially those of cotton, cannot fail to interest American manufacturers. In our growing familiarity with the marvellous amount and delicacy of the products of power looms and other machinery worked by steam, we are in danger of forgetting what is daily accomplished by means of hand looms and the workings of the supple and sensitive fingers. To this day India cotton goods, especially the Dacca muslins, or those from Eastern Bengal, have been imported into England, recommended by their superior softness, richness and durability. So, also, of the calicoes, chintzes, and ginghams, which form the staple manufactures of Coromandel. Though nearly driven out of the European market by cheap and successful imitations, they are still preferred in the East, where the curious believe themselves able to distinguish by the touch and even by the smell these genuine products of the Indian loom. The highest qualities of the Dacca muslins are splendid examples of the superiority of intelligent labor over the most elaborate machinery. The hand of the Hindoo, to use the language of a writer in *Once a Week*, "is educated to a delicacy of touch that is marvellous, and that delicacy is transmitted through succeeding generations until the native manipulator acquires a kind of instinctive aptness, which gives him all the unfailing regularity of a machine, directed by the intelligence of man." The native women spin with the finger a yarn which surpasses in fineness the machine-spun yarn paraded, in the great Exhibition of 1862, as a marvel of European skill. The classes of muslin called "woven air" and "evening dew" are, as their names would import, of surpassing fineness of fabric. It is related that a weaver was chastised and driven out of the city of Dacca for neglecting to prevent his cow from eating up a piece of this quality of muslin which he had spread out and left upon the grass, the article being so fine that the animal could not see it on the herbage. So delicate is the manufacture of the shirt staple of the Dacca cotton that it can only be spun into yarn at certain times of the day. Preference is given to the morning, before the dew has left the grass; or, if spinning be carried on after that time, it is over a pan of water, the evaporation from which yields moisture enough to prevent the fiber from becoming too brittle to handle. The Dacca muslin, with all its delicacy, will wash, while European muslin will not. A piece of "evening dew," one yard wide and four yards long, weighs only one ounce and eighty-six grains.

Figured muslin is a still more costly and delicate work of the Indian loom. No approach has been made by Europeans in producing the charming effect of weaving gold and silver threads into the different fabrics made in India. The embroidery in the woven garments, in which the absolutely pure gold is employed, never tarnishes, and it washes just as well as the other threads of the garment.

What will our American manufacturers, who may look to competing at some future day with the English in supplying the Indian market, say to the following statement made by the writer whom we have quoted above: "A native with a rude bamboo loom will, with his fingers and toes, finish a piece of muslin which cannot by all the application of our most delicate machinery be produced in Europe." A like superiority is evinced in the Hindoo's almost instinctive appreciation of appropriate form and color in design. He has learned to print fast colors. The native fabrics are remarkable for the sobriety and harmony of hue which they present. The English colors will not wash, and even Prussia is gaining the advance in supplying dyed goods to India.—*Philadelphia Ledger.*

Product of a Fleece of Wool.

The product in thread or cloth from a fleece of wool is something astonishing. At Norwich, many years since, 39,200 yards, or twenty-two and a quarter miles of thread, were spun from a single pound of wool; and 60 years ago a Miss Ives, at Spaulding, spun 68,000 yards or about 95½ miles of woolen thread from a pound of wool, off a Lincoln ewe. But this seems nothing to the multiplication a fleece now undergoes at Bradford. From the manufacturer who generally buys by "clip," I obtained this bit of information. A 20 pound Lincoln fleece, used as an admixture with cotton in the finest Alpaca fabrics, suffices for upward of twelve "pieces," each piece of 42 yards in length; it might probably be extended to 16 pieces, or a total length of 672 yards, three feet in breadth. At 3s a yard, the sum realized would £100; and I suppose (though I am not much of a dressmaker), that the crinolines of 80 or 90 ladies were covered with a single fleece of wool.—*J. A. Clark, Long Sutton, Eng.*

Rose Crop.

Mr. Blunt, the British Vice-Consul at Adrianopole, in his report to the Foreign Office this year, gives an account of the rose fields of the neighborhood of Adrianople, extending over 12,000 or 14,000 acres, and supplying by far the most important source of wealth in the district. The season for picking the roses is from the latter part of April to the early part of June; and at sunrise the plains look like a vast garden full of life and fragrance, with hundreds of Bulgarian boys and girls gathering the flowers into baskets and sacks, the air impregnated with the delicious scent, and the scene enlivened by songs, dancing, and music. It is estimated that the rose districts of Adrianople produced in the season of 1865 about 700,000 miscals of attar of roses (the miscal being 1¼ drachms) the price averaging rather more than 3s. per miscal. If the weather is cool in spring, and there are copious falls of dew and occasional showers, the crops prosper, and an abundant yield of oil is secured. The season in 1866 was so favorable that eight okes of petals (less than 23 lbs.), and in some cases seven okes, yielded a miscal of oil. If the weather is very hot and dry, it takes double that quantity of petals. The culture of the rose does not entail much trouble or expense. Land is cheap and moderately taxed. In a favorable season a donum (40 paces square) well cultivated, will produce 1,000 okes of petals, or 100 miscals of oil valued at 1,500 piasters; the expenses would be about 540 piasters—management of the land 55; tithe, 150; picking 75; extraction, 260—leaving a net profit of 960 piasters, or about £8,11s. An average crop generally gives about 5 per donum clear of all expenses. The oil is extracted from the petals by the ordinary process of distillation. The attar is bought up for foreign markets, to which it passes through Constantinople and Smyrna, where it is generally dispatched to undergo the process of adulteration with sandal-wood and other oils. It is said that in London, the Adrianople attar finds a readier sale when it is adulterated than when it is genuine.

A Strange Telegraphic Freak.

A few weeks ago a couple of wires on the New York Central Railroad began to act very unreasonably. At ten o'clock in the morning they would "strike work," and resume at four in the afternoon. A careful examination of the line produced no result. The superintendent himself looked into the matter and saw nothing. It was a complete puzzle. An old Albany operator, however, was more successful. About sixty miles west of that city he found a point where the wires passed over the roof of a building, almost touching it. As the sun rose, the wires fell, and at twelve o'clock they lay snugly together on the tin roof. As the sun fell, they cooled and rose, and by four o'clock they were in their proper positions. Of course the trouble was rectified.

A PATENT has recently been taken in England for introducing into the liquid metal in the puddling or other furnace used for converting cast iron or steel, the vapor of nitric acid or chloric acid rich in oxygen, or their salts, and also the vapor of hydro-acids or other materials rich in hydrogen, or the salts of hydro-acids, or mixtures of the said acid vapor, either alone or combined with a blast of air; or liquid hydro-carbon in a state of vapor may be introduced into the liquid metal. By the introduction of the oxydizing gaseous liquid or solid compound the decarbonization of the iron and the oxidation of silicuous matters in the iron are promoted. When hydro-acids or materials rich in hydrogen, or the salts of hydro-acids, are passed through the melted metal, they are decomposed, and at the moment of decomposition, or when the elements are in a nascent state, they act upon the metal and improve its quality. The quantity of acid or salt employed will depend upon the composition of the iron acted upon.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 9, 1867.

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. Resident 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.

66,440.—SEWING MACHINE.—Wm. W. Abbott, Boston, Mass.

1st, The movable plate, m, or its equivalent, in combination with the revolving cup, Z, the hook, h, when so constructed and arranged as to form the lock stitch, the embroidery stitch, and single chain stitch, at the will of the operator, substantially as set forth and for the purpose described.

2d, I claim an elastic metallic take-up upon the revolving cup, Z, constructed and operating substantially as set forth for the purpose specified.

3d, I claim the combination of a sliding collar with cams, 1, 2, and 3, and annular grooves, 4, with pin, b, lever, W, and spring, V, and pins, U, for changing or reversing the feed motions of sewing machines as described.

4th, I claim the combination of the stationary take-up, t, with an elastic metallic revolving take-up, s, as set forth, for the purpose specified.

5th, I claim the combination of a spool case and a grooved and slotted cup with its hook and movable plate, m, for purposes specified, as described.

66,441.—BROOM HEAD.—L. Allen, Berkley Springs, West Va.

I claim the handle, with its cross piece, B, pinned in the mortise at right angles to the handle, in combination with the perforated leather stock, C, and perforated leather band, E, retained by the recesses, a, in the extension, D, of the socket, substantially as described

66,442.—CLOTHES OR TOWEL RACK.—F. A. Balch, Hingham, Wis.

I claim constructing a folding clothes rack, with bars moving horizontally on a single pivot, with the ledges, G, behind said pivot, which will support said bars in a horizontal position equally well, whether partially or wholly extended, as set forth and described.

In combination with the folding bars, A, frame, B, plates, C D, and pivot, E, the ledges, G G, as set forth and described.

66,443.—RAILWAY CHAIR.—W. H. Baldwin and J. H. Blake, Brandon, Vt.

We claim the combination of the extension ribs, b¹, the rigid wedge gib, c, having lips, c¹ the chair, A, with wedge lips b, and rails, d, having receiving slots, d¹, when the parts are constructed, arranged, and operating as herein represented and described.

66,444.—COVER FOR GAS RETORTS.—B. H. Bartol, Philadelphia, Pa.

I claim, as a new article of manufacture, the within-described retort cover, made of plate iron, depressed in the middle and provided with a wrought-iron rib, b, at the back, with a central rivet or stud, c, all substantially as described.

66,445.—CHURNING AND WORKING BUTTER.—W. D. Baughn, Milford, Mich.

I claim the arrangement and combination of the plow or scraper, M, the cog wheel, I, the standard, K, and rod, N, and the beater, O, all arranged substantially as described for the purpose designed.

66,446.—MUCILAGE BRUSH.—W. W. Beach, New York City.

What I claim is a mucilage brush, formed with a tubular handle, into one end of which the brush is secured, and supplied with mucilage in the manner specified.

I also claim the elastic stopper or cover, fitted to slide upon the tubular handle, in combination with the brush and fountain, as and for the purposes specified.

I claim a tubular handle for a fountain brush, in which the hairs or bristles are entered within the lower end of such tube, and provided with a tube passing through said bristles, to allow the liquid or semi-liquid in the fountain to pass to the brush, as set forth.

I claim a mucilage or fountain brush, formed of a glass tube, composing the handle, an air hole in the same, and a brush entered within or secured to the end of said glass tube, as set forth.

66,447.—MUCILAGE BOTTLE.—W. W. Beach, New York City.

What I claim is a fountain brush for mucilage, formed substantially as shown, with a brush at the mouth of the fountain, and an opening through the same into the fountain, as and for the purposes specified.

I claim the receptacle, d, in combination with the fountain, a, and brush, b, substantially as and for the purposes set forth.

I also claim a fountain for mucilage in combination with a brush that is removable from said fountain so as to be changed for the purposes, and as set forth.

64,448.—INKSTAND AND MUCILAGE HOLDER COMBINED.—W. W. Beach, New York City.

What I claim is a mucilage receptacle and inkstand combined, substantially as and for the purposes set forth.

I also claim the displacer, d, formed with a screw on the outside for adjusting said displacer in the ink, and a cup on its inside for the reception of mucilage, substantially as set forth.

66,449.—MUCILAGE HOLDER.—W. W. Beach, New York City.

What I claim is a mucilage holder and brush, fitted as specified, so that the brush, when not in use, is pressed down into the mucilage, and when in position for use, is projected from the holder, as set forth.

66,450.—WASHING AND WRINGING MACHINE.—C. F. and F. Blood Gravesville, Wis.

1st, We claim the fluted springing pieces, B, arranged and operating substantially in the manner hereinbefore described and for the purpose specified.

2d, The combination of the suspending post, H, with the box, A, by means of the hinge, f, pin, h, and screw, i, substantially in the manner and for the purposes above set forth.

3d The combination and arrangement of the rollers, I and I', with the bed, B, for the double purpose of drawing the clothes from the latter, when washed, and wringing them at one operation, substantially as described.

66,451.—WATER ELEVATOR.—Azro M. Bowles and Hiram Preston, Orfordville, Wis.

We claim the combination and arrangement of the pawl, g, the ratchet on the shafts, B, the brake, E, and lever, F, and button, a, to operate as described and set forth.

66,452.—CONVERTING IRON INTO STEEL.—John F. Boynton, Syracuse, N. Y.

I claim the herein described method of converting iron into steel by passing over or through it, in a close oven or retort, and while in a highly heated state, a current of carbureted or carbonized gas, and at the same time dropping into the oven solid cyanides or solid ammoniacal compounds, substantially as described.

66,453.—INSULATOR FOR TELEGRAPHS.—John F. Boynton, Syracuse, N. Y.

1st, I claim supporting an insulating cap, the whole material of which is a non-conductor, by a non-conducting pin, when such pin is constructed separately from the cap, substantially as shown and described.

2d, I also claim securing a non-conducting pin to an insulating cap, both of which are composed entirely of non-conducting materials, by an insulating cement, as herein set forth.

3d, I also claim securing a non-conducting pin, composed entirely of non-conducting material, to the cross arm, bracket, or telegraph pole, by an insulating cement, as set forth.

4th, I also claim the combination of a non-conducting pin, composed entirely of a non-conducting material, with the slot, A, and binding wire hole, B, substantially as herein set forth.

66,454.—FARM GATE.—J. W. Brewster, West Lawrens, N. Y.

I claim the double track rail, C, when made adjustable, substantially as described and for the purposes set forth.

The blocks, e e e, bands or clasps, f, and keys, h, when used and combined with the posts, B, to operate as and for the purposes specified.

66,455.—CORN HUSKER AND STALK CUTTER.—Elisha Briggs, Sen., Fayette, Iowa.

I claim the combination and arrangement of the main driving shaft and pulley, A, the gears, B B, the corrugated crushers, C C, the pulley and journal, D, the cutters, E E, the driving pulley, H, the feed table, F, the belt, V, the boxes, I I I I, the frame, K, the legs, L L, the lever, O, and the bearing rollers, T T, arranged substantially as described for the purpose designed.

66,456.—WATER WHEEL.—E. Briggs, Sen., Fayette, Iowa.

I claim the arrangement and combination of the floats, A A A, etc., with the valves, a a a, etc., upon the endless apron, B B, carrying the pullies, E E, and the chains, K K, with the braces, H H, the wings, D D, the hitching bars, F F, the bolts, N N, and the slots, I I, and the whole attached and floated upon the frame or raft, C C, all substantially as and for the purposes described.

66,457.—BURGLAR ALARM.—O. M. Brooks and R. W. Soper, Janesville, Wis.

1st, We claim the construction and arrangement of a burglar alarm in such a manner that the movement, by the burglar, of the tripping lever, G, that is inserted in the keyhole of the door to be guarded, shall cause a match to be lighted and a cap or a charge of powder in an attached barrel to be fired, substantially as and for the purpose described.

2d, The combination and arrangement of the tripping lever, G, with the dog, H, and hammer, B, substantially as and for the purpose set forth.

3d, The match holder, D F, when constructed as described, and used to adjust a match either in front of the vent, k, or the orifice, u, substantially as and for the purpose described.

4th, The combination and arrangement of the hammer, B, nipple, S, and part, C1, with the match holder, D F, in such a manner that the hammer does not strike the match, but fires it by the explosion of the cap, substantially as, and for the purpose described.

5th, The combination and arrangement of the hammer, B, nipple, S, part, C1, barrel, C, and match holder, D F, substantially as and for the purpose set forth.

6th, Securing a burglar alarm in the keyhole of a door by means of the screw button, d 1, substantially as and for the purpose set forth.

66,458.—MEANS FOR HANGING MIRRORS.—Frederick Brown, Detroit, Mich.

1st, I claim the hollow standard, B, with the opening, V, the slot, W, and the spiral spring, O, the stem, D, with the set screw, T, and the arm, F, arranged substantially as and for the purpose specified.

2nd, The combination and arrangement of the hollow standard, B, the stem, D, the arm, F, the mirror or reflector, H, the spiral spring, O, the hollow screws, K K, the screws, L L, provided with the slot, d d, the thumb screws, N R T, the hooks, P P, the opening, V, the slot, W, and the gains, a a, all arranged substantially as described for the purpose specified.

66,459.—ATMOSPHERIC ALARM WHISTLE.—Samuel G. Cabell, Quincy, Ill.

1st, I claim the chamber, D, when constructed so that the air chambers, b b1, thereof communicate by means of valves, c c1, on either side of a dividing plate, a, with the whistle, J, for operation substantially as set forth.

2d, The arrangement and combination of the vacuum whistles, d d1, with the blast whistle, J, or their equivalent, for alternate operation, the former serving to supply air to the chamber, D, and the latter to give it vent, by means of valves suitably arranged, and operating substantially as set forth.

3d, The arrangement and combination of the funnel, G, with the chamber, D so as to serve as a gage for the level of the fluid in said chamber, as set forth.

4th, In combination with an air chamber and whistles, I claim the use of any compounds that will, by their decomposition or chemical combination, generate gas, and consequent pressure for operating or sounding said whistles, or their equivalents, essentially as specified.

5th, The combination with the vibrating weight chamber, D, of an air pump, M, and air chamber, I, operating substantially as described.

66,460.—OCTAVE COUPLING FOR REED INSTRUMENTS.—B. O. Church and Hervey Smith, Brattleboro, Vt

We claim the arrangement of the levers, C C and F F, in such manner that the lower levers, C C, pass over and work upon the lower fulcrum, B, and the upper levers, C C, pass under the upper fulcrum rest, E, substantially as and for the purpose shown.

66,461.—MODE OF NUMBERING COUPONS.—S. M. Clark, Washington, D. C.

I claim the method of numbering coupons, bank notes, and other tokens, substantially as herein set forth and described.

66,462.—STEAM-ENGINE LUBRICATORS.—Frank Colligon, Buffalo, N. Y.

I claim, 1st, The combination of a lubricating cup and pump, substantially as described.

2d, In combination therewith, I claim the stop cock, G, as and for the purposes described.

3d, The arrangement of the pump with reference to the cover, I, substantially as herein set forth.

66,463.—RIBBON MAP.—M. Coloney and S. B. Fairchild, St. Louis, Mo.

We claim the map, B, arranged with its end strip, b, in combination with the reel and its crank, C, and the casing, A, substantially as set forth.

66,464.—BRICK KILNS.—Charles B. Corey and Charles M. Turner, Cleveland, Ohio.

1st, I claim the arrangement of the furnace, Q, with side flues, R1, in combination with the kiln, B, for the purpose and in the manner substantially as described, when placed over the suspended charges as they are successively lowered and removed from the kiln,

2d, The shaft, D, roller, K, chains J, and bars, L, when operated conjointly by the screws, G, in combination with the bars, F, for the purpose and in the manner as set forth.

3d Supporting the charges or piles of brick in the kiln by the employment of cross bars, T, passed under said piles and for lowering them down into the the truck, V, and supporting the superimposed piles while the lower pile is being drawn from the pit, substantially as described.

4th, Holding or supporting superimposed piles or charges of bricks in the kiln while being burned, and then discharging the same from said kiln by one continuous automatic operation.

66,465.—CUPOLA AND OTHER FURNACES.—Andrew Cowan and Robert H. Starr, New Haven, Conn.

We claim, 1st, The combination with a cupola or other like furnace of an air or blast receiving or heating chamber, applied to the said furnace in the manner described, so that the heat and other products of combustion generated within the furnace may be brought into direct contact with the metal plates which constitute the inner wall of the said chamber, for the purposes set forth.

2d, The combination with the annular chamber for heating the blast, applied to the furnace, as herein described, with tweers, opening at different elevations into the interior of the said furnace, as and for the purposes shown and specified.

3d, The method of drawing in or contracting the walls of the furnace immediately above the blast-heating chamber, as and for the purposes herein shown and described.

4th, The application to the inner wall of the blast-heating chamber of one or more corrugated or other suitably formed plates for protecting the said chamber against the effects of excessive heat, as shown and set forth.

66,466.—CLOTHES DRYER.—Frank Crandall, Erie, Pa.

I claim the construction of the adjustable clothes racks, revolving one above the other, with notches, H, on the side pieces, E, to clutch the outside posts, A, so as to hold the racks in a horizontal position for the clothes to hang on, as described and set forth.

66,467.—RAILROAD CAR.—L. B. Chittenden, Pittsburg, Pa.

I claim, 1st, A close or latticed-work car frame mounted on trucks, such frame being made of boiler plate or angle iron, and furnished with angle-iron ledges, on which ledges to place brick bearing shelves or trays.

2d, The construction and use in connection with such car of a tongue, l, having an arm, l', the latter provided with one or more pawls, in combination with a corresponding central ratcheted rail, substantially as and for the purposes hereinbefore set forth.

3d, The combination and use, in combination with a car for transporting and drying brick, of a metallic brick-bearing tray, having flanges or projections on either or both of its opposite ledges, so that when such trays are placed side by side in the car, interstices or openings will be left between them for the free circulation of air, substantially as and for the purposes hereinbefore described.

66,468.—BRICK MACHINE.—L. B. Chittenden, Pittsburg, Pa.

1st, I claim the arrangement of devices in an off-bearing brick machine for supplying trays, from the inclined sliding frame, b, to the belts, d d', or rollers, e e', such devices consisting of the slide, o, with a projection, o', in combination with suitable gearing for communicating motion to and operating the same, and in such a way that a tray will be supplied to the belts, d d', or rollers, e e', as soon as each preceding tray shall have passed the foot of the frame, b, substantially in the manner and for the purpose above set forth.

2d, The rollers, e e', of an off-bearing brick machine, in any desirable number, and either with or without belts, d d', and arranged either horizontally or inclined, in combination with a ratchet or other equivalent device for producing intermittent motion, by which a tray resting thereon will be carried forward sufficiently to receive successively a brick at a time, substantially as and for the purposes hereinbefore set forth.

66,469.—CHURN.—James Davies, Mazomania, Wis.

1st, I claim the flutter wheel constructed as described, and arranged in the box, C, on the top of the main churn, with the grated opening at the bottom, as set forth.

2d, The pivoted lever, u, arranged to form the outer bearing for the shaft of the flutter wheel, so that by releasing said lever the band may be loosened, and the wheel stopped independent of the main dasher, as described.

3d, In combination with the ribs, n, secured to the inner wall of the churn, I claim the revolving dasher, B, having its arms constructed of triangular bars, b, with the rectangular perforated enlargement at their outer ends, as described.

66,470.—TWEER.—Hiram Dean, Clyde, Ohio.

I claim the rectangular or oblong opening, D, in combination with the stops, E, levers, F, and box, A, arranged in relation to each other, substantially as and for the purpose set forth.

66,471.—JOURNAL AND AXLE BOXES.—P. S. Devlan, Jersey City, N. J.

I claim the combination with a metallic or other hard journal or axle box, of strips of wood inserted in dovetail grooves therein substantially as shown and described.

66,472.—LINING FOR JOURNAL AND AXLE BOXES.—P. S. Devlan, Jersey City, N. J.

I claim an axle or journal box or lining thereto, constructed substantially as described, with recesses open at their one, but closing at their opposite, end alternately for the insertion of the anti-friction or lubricating material, essentially as herein set forth.

66,473.—CHECK HOOK.—Nich. Dieterich, Sandwich, Ohio.

I claim a check hook constructed substantially as and for the purposes specified.

66,474.—COUPLING, JOURNAL AND BOX.—D. H. Dotterer, Philadelphia, Pa.

1st, I claim a journal, D, in combination with the anti-friction rollers, C and C', turning on stationary axes when geared together, substantially as and for the purpose herein set forth.

2d, The hollow anti-friction rollers, C and C', arranged to turn on stationary spindles fitted to the case, B, as described.

3d, The trunnions, a a, on the box, adapted to and arranged to vibrate in the portion, A, of the hanger, and confined vertically thereto by set screws, f f, all substantially as set forth.

4th, The coupling journal, D, provided at one or both ends with tubular enlargement, F, constructed for the reception of a shaft, substantially as set forth.

5th, The hollow enlargement, F, its lateral opening for the introduction of the shaft, and the follower, h, adapted to the said opening and confined therein by the ring, G, or its equivalent.

6th, The tapering exterior of the enlargement, F, and the detachable follower, h, forming a continuation of the said tapering enlargement, in combination with the tapering ring, G.

7th, The combination of the follower, h, and its feather or projection, l, with the grooved end of the shaft.

66,475.—PAINT BRUSH.—B. Adams Drayton, Utica, N. Y.

1st, I claim thimble F, constructed in the form and manner herein described and for the uses and purposes mentioned.

2d, The thimble F, and cap E, and the shoulders B B, of the handle, in combination for the uses and purposes mentioned.

3d, The thimbles, G and F, and cap, E, in combination for the uses and purposes mentioned.

66,476.—HAIR CURLER.—Sallie Ann Early (assignor to Samuel R. Nagel), Philadelphia, Pa.

I claim the within-described hair curler, composed of the curved bar, A, of wood or other light material, and the retaining wire, B, hinged to one end of the said bar, and having a bent end fitted to a slot in the opposite end of the bar, all substantially as set forth.

66,477.—PLOW.—Henry H. Ebaugh, Hereford, Md.

1st, I claim mounting the supporting wheels, B C, in swing frames, D E, pivoted to the main frame, A, arranged and operating substantially as and for the purpose herein specified.

2d, I also claim the winding pulleys, N O, of different sizes, in combination with the chains, bands, or ropes, n o, and swing frames, D E, substantially as and for the purpose herein set forth.

3d, In combination with the foregoing, I also claim the pulleys, P R, crank, S, and its ratchet and pawl, substantially as and for the purpose herein specified.

4th, I also claim the gage wheel, I, when arranged and operating in connection with the swing frames, D E, as and for the purpose set forth.

5th, I also claim the arrangement of the pole or tongue, G, in the roller, H, and guide socket, g, as herein specified.

66,478.—CHURN.—James P. Edmonds, Rochelle, Ill.

1st, I claim the peculiarly-formed portable or removable supporting frame, C M B D, with the shaft, F, and wheel, E, arranged as and for the purposes set forth.

2d, I claim providing the bar, D, with a slot, d, when used in combination with the aforesaid portable frame and wheel and the dasher handle, as and for the purposes specified.

3d, I claim providing the wheel, E, with a series of unequal openings, u v x y z, in combination with the arm, N, upon the handle, B, as and for the purpose described.

66,479.—CAR-SEAT LOCK.—Martin P. Ford, Columbus, Ohio.

I claim recessing the cam, A, and spring lever, o, into the back of the plate, so as to present a flush surface as herein described.

66,480.—APPARATUS FOR EVAPORATING SORGHUM JUICE AND OTHER LIQUIDS.—Henry Fowler, Bronson, Mich.

I claim the arrangement of the steam chamber, D, pipes, a a a and E, connected with the water chamber, F, and discharging pipe, f, in combination with the eduction pipe, G, safety valve, h, lever, H, and weight, k, operating substantially as and for the purposes set forth.

I also claim the arrangement of the horizontal steam pipes, in such manner that the greatest heat will be in the center of the boiling pan, thus throwing the impurities and scum to the side and corners of the pan or evaporator, as and for the purposes herein described.

66,481.—BED BOTTOM.—F. S. Frost, West Cambridge, Mass.

I claim, 1st, The combination of the springs, e, connected by straps to the slats, d, the bars, b d, and the straps, g, as and for the purposes specified.

2d, The extended springs, e', in combination with the bars, b e, and the bar b, provided with the elastic pads, 1, as and for the purpose specified.

66,482.—ANTI-RHEUMATIC LINIMENT.—J Galette, N. Y. City.

I claim, 1st, The use of oleum crotonis and oleum creosoti, in combination with other substances, as a remedy against rheumatism.

2d, The compounding and mixing of the new anti-rheumatic liniment, substantially as herein described and for the purpose specified.

66,483.—TRUNK LOCK.—Sereno Gaylord, Chicopee, Mass.

I claim, 1st, In a catch lock placing two or more catches, A A' B B', on each side of the key pin, and working on pins, I I, at their lower ends, the distances between the key pin and key bearings being different on the upper and lower catches, so that by reversing the same a different lock may be formed, the parts arranged substantially as herein shown.

2d, In combination with the above the key guards, C and D, arranged substantially as and for the purpose shown.

66,484.—SAW SET.—John M. Geer, Holden, Mass., assignor to Dodge and Wellington, Worcester, Mass.

I claim the head, B, constructed in the manner described for supporting the head, C, with the extending jaw, E, and laterally-projecting arm, F, substantially in the manner set forth.

66,485.—CORN SHELLER.—H. A. Graeff, Birdsboro, Pa.

I claim the arrangement and combination as above set forth with which the shellers, A, in Figs. 1 2 3 and 4, are attached, and worked by the fork, E I, in Fig. 1, together with the knife, D, in Fig. 3, for cutting green corn from the cob.

66,486.—MODE OF DRYING BRICKS.—Isaac Gregg, Philadelphia, Pa.

I claim an oven, A, having openings at both ends, and containing or surrounded by one or more steam casings or steam pipes, in combination with endless bands or chains, e e, which extend through the oven, and to which either an uniform or an intermittent motion is imparted, all substantially as and for the purpose described.

66,487.—APPARATUS FOR HEATING CLAY.—Isaac Gregg, Philadelphia, Pa.

I claim, 1st, A casing or vessel, A, surrounded by or containing a steam casing or coil, in combination with a shaft, C, having blades or arms, D D, the whole being constructed and operating substantially as described.

2d, The combination of the above with a steam pipe, communicating with the casing for the purpose specified.

3d, A casing A, consisting of two detachable sections, b b', containing chamber, X, communicating with a steam boiler and adapted to each other, and enclosing a shaft having arms or blades secured to the same, all substantially as and for the purpose set forth.

4th, The combination of the above and the stuffing boxes, f, and followers, g, constructed as described.

66,488.—APPARATUS FOR TREATING CLAY.—Isaac Gregg, Philadelphia, Pa.

I claim the two tapering rollers, C and C', geared together and arranged to operate on the clay and stones contained therein as set forth.

66,489.—FOOT SCRAPER AND UMBRELLA STAND.—Charles Gudehus and F. Staake, Philadelphia, Pa.

We claim as a new article of manufacture the device consisting of case, a, drawer, b, scraper, d, umbrella stand, f g, and brushes, h i k m, combined and arranged substantially as shown and described.

66,490.—SPRING FOR BEDS.—D. F. Haasz, Philadelphia, Pa.

I claim the springs, d d, links, f f, and bar, b, in combination with the strap, A, sliding rod, a and disk, b, or its equivalent, the whole being constructed, arranged, and operating substantially as and for the purpose described.

66,491.—CULTIVATOR.—M. Haskins and D. B. Hart, Mentor, O.

1st, I claim the use and employment, specially, of cultivator shovels or plows, M, provided with perforations or open insertions, made transversely across the blade, or in any direction that will serve the purpose contemplated, as herein set forth.

2d, The use and employment of the blinds, N N, provided with slots, and with jogs, O O, in combination with the above described perforated shovels or plows, M, and operating substantially as and for the purpose specified.

3d, The use and employment of said described perforated shovels, M, with and without the said described blinds, N N, in combination with the slotted right-angled beam, H, cross tie, I, rods, G G, grooved clevis, E, beam, F, plow standards, P1, swivel braces, Q, brace, Q1, slotted bands, P4, band, P5, and bolts, P2, all arranged, combined, and operating as and for the purposes described.

4th, The graduated standards, J, plow handles, K, rod, R, and joints in beam, F, combined and operating as and for the purpose described.

66,492.—EGG TONGS.—W. F. Hellen, Washington, D. C.

I claim the construction and form of the tongs, A, to correspond with the shape of an egg, when constructed of any material with or without teeth, B, and with any kind of a handle to operate them, as herein described and for the purposes set forth.

66,493.—THILL ATTACHMENT.—H. R. Hoagland, Montezuma, N. Y.

I claim the combination of the thill attachment, D, with the clip head, B, when said clip head is provided with a uniform transverse bore open at both ends and also with a transverse slot whose sides shall form an acute angle with the arm, A, substantially for the purpose set forth.

66,494.—AUTOMATIC FEED FOR STEAM PANS.—Henry Holcomb, Painesville, Ohio.

1st, I claim the within described automatic feed apparatus, consisting of the reservoir, A, filler, B, supply pipes, C and H, stop cocks, E and I, and air pipe, F, arranged, combined, and operating as herein set forth and for the purpose specified.

2d, The combination of the said described apparatus with vapor pans, evaporators, tanks, and other articles used in the processes of the evaporation of fluids.

66,495.—CULTIVATOR.—Hanford Ingraham, Naples, N. Y.

1st, I claim the arrangement of the standards and cross bars with the molds or shares, as constructed in combination with the thills, substantially in the manner and for the purposes as herein described.

2d, The adjustment of the shares to the required angle, by means of adjustable plates, with flanges substantially in the manner and for the purpose as herein described.

3d, The adjustable clasps in combination with cross bar, E the thills, rods standards, and shares, substantially in the manner and for the purposes as herein described.

66,496.—TOP PROP NUT FOR CARRIAGES.—James Ives, Mount Carmel, Conn.

I claim as a new and improved article of manufacture, a top prop nut, constructed with a solid head on screw tapped socket.

66,497.—LOCK FOR VALISES, ETC.—Thomas James, New York City.

I claim the bolt, C, provided with a notch, a, and two or more hooked catches with corresponding staples in the opposite jaw, in combination with the sliding catch, E, and drop, F, the whole constructed and arranged substantially as and for the purposes specified.

66,498.—FIRE ANNIHILATOR.—Chas. T. Jerome, Minneapolis, Minn.

I claim the application of a quick match which will take fire at a low temperature, to an apparatus for extinguishing fires by the injection upon the same of a gaseous non supporter of combustion, substantially as described.

2d, Providing the gas generating vessel, D, with a water chamber, substantially as described.

66,499.—AMALGAMATOR AND CONCENTRATOR.—George Johnston and Edwin G. Smith, Auburn, Cal.

We claim, 1st, The revolving belt or apron, F, with its raised edges, O, having a shaking or rocking motion from side to side, substantially as and for the purpose described.

2d, The amalgamating plate, E, in combination with the revolving shaking belt or apron, substantially as and for the purpose described.

3d, The box, M, with its jets in the direction of the motion of the belt or apron, together with the roller, N, substantially as and for the purposes described.

66,500.—PROCESS FOR MANUFACTURING BANK NOTES, ETC.—George T. Jones, Cincinnati, Ohio.

I claim the combined process herein described for producing bank notes or other securities by plate and surface printing at separate operations and with various colors on unsized paper and subsequently perfecting the paper and locking up the prints therein by the application of size, which is subsequently rendered insoluble by heat.

66,501.—FARM GATE.—Henry H. Kelty, Northfield, Ohio.

I claim the gate, A, constructed with inclined bars, B C, in combination with the slotted stay, G, as and for the purpose herein substantially as described.

64,502.—PERMUTATION LOCK.—W. F. Kistler, Chicago, Ill.

I claim, 1st, The arrangement of a movable slide, F, of the arm, E, of the knob spindle, for operating the tumblers, substantially as and for the purposed [illegible].

3d, The combination with said movable slide, F, the arrangement of the cam, g, so as to operate said slide, substantially as specified.

3d, The arrangement of the auxiliary cams, e h' in combination with said cam, g, to bring the pin, f, at the proper position when it reaches the cam, g, causing it to operate as set forth.

4th, The combination of the tumblers and their drivers with said slide, F, and spindle, s, arranged and operating in the manner described.

5th, The combination of the dog, M, block lever, V V', click, V, and arm, b'', arranged so as to operate in the manner and for the purposes set forth.

6th, In combination with the last foregoing, the arms, W, and lip, w, and the stop, R, arranged substantially in the manner and operating substantially as described.

7th, In combination with said arm, W, the arm, Z, and its connections, with the dog, S, arranged and operating in the manner and for the purposes specified.

8th, In combination with the arm, b'', the arm, Z, provided with a shoulder, Z' and the connections, Y X, or the equivalent, for the purpose of raising up the dog, S, from the bolt, D, substantially as specified and set forth.

9th, In combination with the arm, W, the arrangement of an arm, a', upon the spindle, s, so as to operate in the manner and for the purposes described.

66,503.—FRYING PAN.—Geo. H. Knight, Cincinnati, Ohio.

I claim, 1st, The combination of the eccentric rim, F, with the vertical or nearly vertical fume duct, B, descending within the said rim, substantially as and for the purposes set forth.

2d, The combination of the ducts, D and B, with the skillet, A, and cover, C, substantially as and for the purposes set forth.

66,504.—SHADE HOLDERS FOR LAMPS AND GAS BURNERS.—Hezekiah Knowles, Brooklyn, N. Y.

I claim the extensible adjustable shade holder consisting of movable and fixed arms combined with each other and with the central support substantially as described.

66,505.—FEED BARS FOR SEWING MACHINES.—Sanford Littlefield, Grafton, N.Y., assignor to C. S. Smith and P. J. Marsh, Troy, N.Y.

I claim, 1st, The employment of an adjustable and removable part or piece, E, of vulcanized rubber or other suitable material, in combination with the feed bar of a sewing machine, and at or near the feed point or part which carries the feeding surface, so as to receive the wear from the action of that part of the machine which moves it forward, in the manner and for the purposes substantially as herein described.

2d, The employment and combination with the feed bar, B, of a sewing machine of an adjustable and movable vulcanized rubber piece, D, or its equivalent, in the manner and for the purposes substantially as herein described and set forth.

66,506.—WELL TUBES AND POINTS.—Ira A. Livingston, Hornellsville, N. Y.

I claim the solid metal point, A, shank, X, socket, y, in combination with the rectangular slot, b e, and projection, f, on the shank, to secure the main tube, C, in connection with the outer tube or shield, B, and coupling, D, operating in the manner as and for the purposes herein set forth.

66,507.—AUTOMATIC FAN.—Wm. O. Loeffler, New York City.

I claim, 1st, The fan, F, in combination with the roller, d, and oscillating frame, E, constructed and operating substantially as and for the purpose set forth.

2d, The slats, F, and slotted cross bar, g, in combination with the fan, F, and oscillating frame, E, constructed and operating substantially as and for the purpose described.

3d, The flexible connection, i, in combination with the oscillating frame, E, and rocking lever, J, constructed and operating substantially as and for the purpose set forth

66,508.—MOLDING BOX.—Thos. L. Luders, Olney, Ill.

I claim, 1st, In combination with a flask or box constructed substantially as described, the lifting levers, as and for the purpose set forth.

2d, The adjustable tapering and bevel edged guide, B, on one portion of a molding box, in combination with the lugs, h h, or their equivalents on the other portion of the box.

66,509.—COMPOUND FOR CLEANING GLASS AND POLISHING METALLIC WARES.—H. P. Marquam, Harrisburg, Pa.

I claim the above compound prepared as and for the purpose set forth.

66,510.—WINDOW BLIND FASTENING.—N. F. Mathewson, Barrington, assignor to himself and Nathaniel Grant, Providence, R. I. Antedated June 27, 1867.

I claim the improved fastening for blinds described, consisting of two independent latches, B and F, in combination and arranged to engage with appropriate catches, substantially as set forth.

66,511.—MANUFACTURE OF ILLUMINATING GAS.—George McKenzie, Glasgow, Scotland.

I claim the combining of pulverized coal and mineral oil to form a compound to be used for obtaining illuminating gas, substantially as hereinbefore describep.

66,512.—PROCESS FOR PREPARING WOOD FOR THE MANUFACTURE OF LABELS, TAGS, ETC.—John Melling, Rochester, N. Y.

I claim, 1st, The treatment of cedar or other suitable wood, with the solution, substantially in the manner and for the purposes herein shown and described.

2d, The proportions of the ingredients forming the solution for the treatment of the above mentioned substance, substantially as set forth.

66,513.—TAILORS' CRAYON SHARPENER.—Benj. W. Minor and Allen Colburn, Boston, Mass.

We claim the cutter as composed of the cross bar and tube arranged and slotted as described.

We also claim the combination and arrangement of the cutter and the waste-intercepting cup.

We also claim the combination and arrangement of the cutter, the waste-intercepting cup, and the base or weight, the whole being as and for the purposes described.

66,514.—PRINTERS' CHASE.—John N. Murray, Chicago, Ill.

I claim the combination and arrangement of the frame, A, the bars, B C, and slides, b c, and clasp, d, and set screws, S, operating substantially as and for the purposes described.

66,515.—GATE LATCH.—E. Nicholson, Rockport, Ohio.

I claim the construction of the latch, D, provided with the shoulders, b b', notch, c, and curved shoulders, F, as arranged in combination with the spring, E, slotted plates, C C', and gate, for the purpose and in the manner as set forth.

66,516.—STOVE PIPE SHELF.—Luther Olds, Battle Creek, Mich.

I claim a portable shelf which is adapted for being secured to and sustained by a stove pipe, substantially in the manner and for the purpose described.

66,517.—FRUIT PICKER.—Samuel Page, McAllisterville, Pa.

I claim the combination of the forked plate, A, with notches, A', recess, C, handle, B, shearing knife, D, and cord, K, said several parts being respectively constructed and arranged for use substantially as described.

2d, The combination of the fruit picker and adjustable rest, as shown in fig. 3, substantially as described.

66,518.—MANUFACTURE OF RUBBER HOSE.—E. L. Perry, New York City, and William A. Torrey, Montclair, N. J.

I claim, 1st, In the manufacture of india-rubber or gutta-percha hose, covering the joint or joints of the mandrel in which the hose is made, with a strip or strips of paper, substantially as and for the purpose described.

2d, In interposing between the inner tube or lining to india-rubber or gutta-percha, and the outer covering of whatever material made, a layer or layers of any suitable air and water-proof stock or material, substantially as and for the purpose specified.

3d, In the manufacture of india-rubber or gutta-percha hose, so winding the cotton, duck or other fibrous or textile fabric used, that the warp threads of the fabric, will intersect or cross each other, substantially as and for the purpose specified.

66,519.—PLANING MACHINE.—F. J. Plummer, Worcester, Mass., assignors to R. Ball & Co.

I claim, 1st, Supporting the matcher spindles and heads in a swinging frame constructed and operated substantially in the manner and for the purposes stated.

2d, I claim in a machine such as described, the combination of the swinging matcher head bed or frame, with the arms, H, cam arms, L, and shaft, M, substantially as herein shown and specified.

3d, The combination of the arms, H, and connecting bolts, o, with the slotted cam arms, L, in the manner and for the purpose described.

4th, The combination with the arms, H H, of the horns, J J, and the shaft, M, substantially as and for the purposes set forth.

5th, The combination with the rear ends of arms, H H, of the projections, I I, and oblong holes or slots, g g, for the purpose stated.

66,520.—CLOTHES DRYER.—W. F. Redding, Saratoga Springs, N. Y.

I claim, 1st, The combination of the sliding tube, D, mounted on the square post, and collar, E, provided with recesses for supporting the arms, substantially as shown and described.

2d, The metal belt, G, passing over the pulley, d, and fitting in the groove, l, when used in connection with the tube, D, and windlass, F, for raising and lowering the reel as herein set forth.

3d, The blocks, b c, or their equivalents attached to the post, B, for holding the arms when putting them up or taking them down as shown and described.

4th, Providing the base, A, with the staples, a, for securing the apparatus in place, substantially as described.

66,521.—TEA KETTLE.—Ezra Ridley, Troy, N. Y.

I claim a tea kettle having an edgewise swinging cover pivoted to or upon an inwardly extended part, b, of a rim around the opening in the top of the tea kettle, when the whole is so constructed that if the cover be partially or nearly closed and the tea kettle then inclined forward, as in pouring water out of the spout, the weight or gravity of the cover will then make or tend to make the cover swing shut and stay shut, substantially as herein set forth.

66,522.—PIANO FORTE STOOL.—George Schmidt, Dobbs Ferry, N. Y.

I claim, 1st, The combination of the seat, A, spindle, B, with a groove, C, in it, and spiral springs J, with the center plate, E, having a tongue, D, thereon and frame, F, as hereinbefore set forth.

66,523.—CLOTHES PIN.—Ebenezer Seaver, Boston, Mass.

I claim, 1st, A clothes pin composed of a base piece or clamp, A, a hinged clasp, B, and a locking device, C, substantially as described or its equivalent for securing the clasp in position.

2d, I claim the spring, c, or its equivalent in combination with the clamp, A, and clasp, B, as and for the purpose specified.

3d, I claim the toothed or corrugated edges, a a', in combination with the grooves, b b', in the clamp, A, and clasp, B, as and for the purpose set forth.

66,524.—WEIGHING SCALE.—Reuben Shaler, Madison, Ct.

I claim, 1st, The combination with flat springs, C, of a scale of the pieces, a, substantially as and for the purpose set forth.

2d, Making the springs, C, of a weighing scale constructed substantially as described, concave on their edges, so that they shall gradually diminish in width from the ends to the center, substantially as and for the purpose specified.

3d, The combination with the rack, I, and pointer, G, with the set screw, e, operating substantially as described for the purpose set forth.

66,525.—MANURE DRAY.—A. H. Shock, Piqua, Pa.

I claim the arrangement of the combined central runner, B, with the revolving hook shaft, S, and its bearings, s, in combination with the spring bolt, E, with its notched head, C, peg or shoulder, P, operated by the lever, L, in the manner and for the purpose specified.

66,526.—LAMP EXTINGUISHER.—G. Simpson and W. H. Edmunds, Waterbury, Vt.

I claim the combination of the socket, a a, with the hinged cap, B, connecting rod, b, crank, c, and wick tube, A, constructed and operating substantially in the manner herein described for the purposes herein set forth.

66,527.—STARTING ENGINES AND OTHER MACHINERY OFF THEIR CENTERS.—Alfred Sims, New York City.

I claim the presser, A A' attached to the frame of a steam engine or to any part in proximity to said engine by pivots, swivels, hinges or by movable slides or other equivalent devices to operate in combination with the crank, B, substantially as and for the purposes described.

66,528.—STAMP AFFIXER AND CANCELLER.—T. A. Slack, Peoria, Ills.

I claim the combination of an adhesive stamp feeder and affixer with a stamp canceller, substantially in the manner and for the purposes as herein set forth.

2d, The movable frame or arms, d d, rollers, e h and l, and spring, f, as arranged and operated in combination with the ink ribbon stamp, substantially for the purposes and in the manner as herein set forth.

3d, The arrangement of the arm, q, in combination with the lever shaft, p, for attaching and detaching the stamp feeder to and from the stamp canceller, substantially in the manner and for the purposes as herein set forth.

4th, The stamp feeding machine as described, in combination with the stamp canceller, substantially in the manner and for the purposes as herein described.

66,529.—AMALGAMATING THE PRECIOUS METALS.—H. J. Smith, Boston, Mass.

I claim, 1st, An amalgamating apparatus in which mercury is made to pass from an amalgamating chamber to a regenerating tank in which its amalgamative power is increased, as described.

2d, Renewing or increasing the amalgamative energy of mercury by passing it through or bringing it in contact with a solution of one of the compounds, or salts, of an electro positive metal, subjected to an electric current, as specified.

3d, Causing the mercury in an amalgamating apparatus after regeneration, to flow in a direction opposite to that taken by the comminuted ores on which it is intended to operate, so that the one least charged with metal shall encounter mercury of the greatest amalgamative energy as set forth.

4th, Directly and continuously supplying to mercury used in the extraction of metals from their ores, the waste of the amalgamative energy which occurs in the process of amalgamation, by bringing it into contact with a solution of one of the salts, or compounds, of an electro-positive metal acted upon by an electrical current, as described.

5th, Causing the ore to be operated upon, to pass through revolving perforated plates in the amalgamating chamber, in the manner set forth.

6th, The arrangement for conjoint operation in an amalgamating apparatus, of an amalgamating chamber, regenerating tank and electric battery, substantially in the manner and for the purpose described.

66,530.—HORSE HAY FORK.—Frederick Snyder, Hinkleton, Pa.

1st, I claim the combination of the brace handles, I I' with the tine handles, A B, above and below the tine heads, J K, to which the tines, L, are affixed together with the quadrant loop, H, embracing the tine handle, B, arranged and operating in the manner and for the purpose specified.

2d, I also claim the construction of the slotted cap, D, with its hook and prolonged arm, d, when held the end of the tine handle, B, by a pivot, F, in combination with the link, E, and tripper, C, with its shoulder, N, and loop, M, the whole arranged and operating in the manner and for the purpose specified.

66,531.—TOY GUN.—Ebenezer Sperry, Miami Village, Kan.

I claim the combination of the detent, E, with the guard spring, F, and check piece, f2, and the trigger, E', substantially as set forth

66,532.—FLOATING WHEEL FOR VESSELS.—John Spilman, Tonawanda, N. Y.

I claim the partially submerged floating wheel, A, consisting of the buoyant cylinder, C, helical wing or wings, E E, and case, f, for producing rotary motion by the resistance of the water when moved in contact therewith, substantially as and for the purposes set forth.

66,533.—STEELYARD.—W. A. Starratt, Boston, Mass.

I claim the combination of the elastic cushion, c, with the head, b, of the weight arm and with the weight, D, arranged to slide on such arm in manner and under circumstances, substantially as specified.

66,534.—MOSQUITO SCREEN FOR WINDOWS.—Theophilus Stover, Cambridgeport, Mass.

1st, I claim the application of sliding screens, C, to screen frame, B, substantially in the manner and for the purposes described.

2d, The netting strips, D D, with a passage between their lapped edges, applied to a frame and controlled by springs or their equivalent, substantially as described.

66,535.—SADIRON.—E. H. Taylor, Batavia, N. Y.

I claim the combination and arrangement of the rear end and side ribs, b b', with the bottom ribs, b2, for allowing a free air space all around the interior, and strengthening the sides and ends of the box against the blows of the heater, as herein set forth.

I also claim, in combination with the slide, D, provided with the rib guides, b b, the arrangement of the pivot stem, c, with the pin, g, and the guide socket, d, with slots, f, the whole operating in the manner and for the purpose set forth.

66,536.—MACHINE FOR GRINDING CLAY.—William H. Thomas, Chicago, Ill.

I claim the screw rollers, A A, having screw threads, B, running their entire length and alternate screw threads, C, extending to a point near the feed hopper, J, the depressions between the screws at the tail, I, of the rollers being made deeper than at the feed end, substantially as and for the purpose set forth.

66,537.—STEAM PISTON PACKING.—Theodore Thurber, Auburn, N. Y.

I claim the grooves or recesses in the edges of the packing ring, C, as and for the purposes herein specified.

66,538.—DOOR SPRING.—T. Van Kannel, Cincinnati, Ohio.

1st, I claim a door spring, made and operating substantially as herein shown and described.

2d, The extension bar, d, when made and operating substantially as herein shown and described.

3d, The rubber bolster, b, in combination with the rod, d, for the purpose of preventing the latter from being thrown against the door when the same is opened and to assist in throwing it back when the door is being closed.

4th, The swing lever, d, attached to the door, A, and operated by a spring, f, which is attached to an adjustable projection, g, from the lintel of the casing, as set forth.

66,539.—CARPET WADDING.—Enoch Waite, Franklin, Mass., assignor to himself and S. M. Weld, Sr., Jamaica Plain, Mass.

I claim an improved carpet wadding composed of one or more bats of fibrous material and one or more layers or sheets of paper combined by imbedding or pressing the fibrous bat or bats upon and into the paper while the latter is in the condition of partially hardened pulp capable of receiving the fibers of the bat or bats and when dry of adhering and holding them in place or in connection with the sheet or sheets of paper without the use of starch, paste, or an adhesive gum as heretofore employed for such purpose.

66,540.—JOINTS OF METALLIC CASKS, ETC.—Maximilian Wappich, Sacramento, Cal. Antedated June 29, 1867.

I claim my improved mode of rendering impervious the joints made in barrels, tanks, or other vessels which are constructed of sheet or plate metal by the insertion of a packing of soft metal or alloy in grooves provided for that purpose which are not in line with the rivets or bolts and are so constructed and arranged that such packing may be inserted after the riveting has been completed, substantially as and for the purpose described.

66,541.—CONDENSER.—N. W. Wheeler, Brooklyn, N. Y.

I claim, 1st, The combination of the piston, l, with the valved circulating heads or inlets, F F, or their equivalents, substantially as and for the purposes described.

2d, The combination of the valve, B2, with the pot, B, or its equivalent, substantially as and for the purposes described.

3d, The combination of the sniffling or air force pump, t u w, with a surface condenser, when the delivery valve, w, is loaded, substantially as and for the purposes described.

66,542.—REVOLVING FIRE-ARM.—Rollin White, Lowell, Mass.

I claim the rotating many-chambered cylinder and the frame constructed so that the cartridge or shells can be ejected without dismounting, the cylinder, in combination with the movable obstructor, pressing directly against the ends of the cartridges and detaining them in the cylinder as well when it is rotating as when in position for firing, and with a spring to force back the movable obstructor against the end of the cylinder, substantially as and for the purpose specified.

And I also claim, in combination with the rotating many-chambered cylinder, the vibrating anvil to support the primed portion of the cartridge, in combination with the hammer, or equivalent, for striking the opposite side of that portion of the cartridge which contains the fulminate priming, substantially as and for the purpose specified.

66,543.—OVEN OR FURNACE FOR HEATING THE BLASTS OF BLAST FURNACES.—Thomas Whitwell, Stockton on Tees, England. Patented in England Nov. 10, 1865.

I claim the construction of furnaces, ovens or chambers with internal walls or partitions for heating the blast for blast furnaces with openings at the top capable of being closed by means of plugs or doors and also with openings at bottom of the sides thereof capable of being closed by means of doors or valves and the whole acting substantially as herein described for the purpose of cleansing the interior of such furnaces, ovens or chambers from dust, as hereinbefore described.

66,544.—CARRIAGE-SHAFT COUPLING.—C. A. Willard, Bellevue, Ohio.

I claim the slide, G, as arranged in combination with the stay, B, and shaft, C, provided with a notch, F, for the purpose and in the manner as set forth.

66,545.—APPARATUS FOR CARBURETING AIR AND REGULATING ITS FLOW.—Joseph S. Wood, Philadelphia, Pa.

1st, I claim utilizing the interior of the double-case water vessel, A B, by the arrangement of the pump, G, inverted receiver, C, and pipe, D, operating as an air forcing apparatus, substantially as specified.

2d, I claim the valve, K, constructed with a head, K1, elastic seat, K2, and with conical plain sides tapering at the angles shown, and operating substantially as described.

3d, The construction of the vessel, F, with a chamber formed between the diaphragm plate, H, and the bottom, f', in which the carbureter, N n', or its equivalent, operates in combination with the inverted receiver, O, with a suspended valve pipe, R, and outlet, R', substantially as shown and specified.

4th, I claim the arrangement of the carbonizer, N, pipes, n', conical partition, H, valve, K, receiver O, and pipe, R, and vessel, F, substantially as described.

5th, I claim the air forcing arrangement, T, in combination with the carbureting air arrangement, W, substantially as described.

66,546.—ANNEALING SHEET IRON.—W. D. Wood, Borough of McKee's Port, Pa.

1st, I claim the use, in the process of annealing sheet iron, of boxes so constructed substantially as hereinbefore described that the sheets may be compressed between the top and bottom of the box for the purpose of preventing their discoloration.

2d, The use of annealing boxes so constructed as that the box piece and bottom piece may be clamped or securely fastened together for the purpose of preserving the shape of the box and preventing its warping while cooling, substantially as hereinbefore described.

3d, Annealing imitation Russia or other glazed or polished sheet iron in packs or layers forcibly compressed together and held under rigid compression during the process of annealing.

66,547.—COMBINATION OF PAPER WEIGHT AND PEN WIPER.—D. W. Wright, New York City.

I claim a paper weight and pen wiper combined, constructed substantially in the manner as and for the purposes set forth.

66,548.—BOOT AND SHOE SOLE.—Frederick Ashley, New York City.

I claim the method of securing the rear end of the detachable half sole by clamps arranged in relation to the notches, a, substantially as set forth.

66,549.—BED BOTTOM.—Dwight Babcock, Seneca Falls, N. Y.

1st, I claim securing the upper slats, D, to the spring, C, by means of ribbons, E, substantially in the manner and for the purposes herein specified and described.

2d, A head rest arranged in a spring bed bottom and consisting of the boards, F and G, springs, d d, and ribbons, f f, all made, secured and connected substantially in the manner herein specified and described.

66,550.—ANIMAL TRAP.—L. V. Badger, Chicago, Ill.

1st, I claim the combination of the connecting rods, C, and slide, D, having a trigger, d', formed upon or attached to its lower end with each other and with the pivoted doors, B, and side of the box, A, substantially as herein shown and described and for the purpose set forth.

2d, Forming a bait chamber in the pivoted platform, F, substantially as herein shown and described and for the purpose set forth.

66,551.—WASHING MACHINE.—D. S. Beckley, Toledo, Iowa.

I claim a washing machine in which the pressure upon the clothes, placed between the rubbing board F, and concave G, may be regulated by means of the spring E, lever H, cord I, and pulley K, when combined and arranged to operate substantially as set forth.

66,552.—CREAM STRAINER.—Geo. J. Bennett, Homer, N. Y.

1st, I claim the screw C, when arranged as described in combination with the removable strainer B, all made and operating substantially as herein shown and described.

2d, The hopper G, when arranged as described in combination with the strainer B, screw C, and bottom a, of the vessel A, all made and operating substantially as set forth.

3d, A cream strainer made and operating substantially as herein shown and described.

66,553.—WASHING MACHINE.—Wm. Bicknell, Hartford, Me.

1st, I claim the combination with the tub B, of the fluted removable cover C, and perforated dasher E, all made and operating substantially as and for the purpose herein shown and described.

2d, The dasher E, and cover C, in combination with the rods F and b, lever H, hook e, and rack f, all made and operating substantially as and for the purpose herein shown and described.

66,554.—BAG HOLDER.—Benj. S. Boydston, Richmond, Ind.

I claim the metallic hoop C, with its spurs, when secured to the board B, by means of the keepers m m, in such a manner as to be contracted or expanded to suit the mouth of the bag, as specified.

66,555.—WASHING MACHINE.—Samuel Brackett, Port Huron, Mich.

1st, I claim the flexible semi-circular concaves F F, when pivoted to sliding plates D, and operated by handle G, in combination with the revolving or oscillating roller C, all made and operating substantially as herein shown and described.

2d, The friction rollers E, when arranged adjustably around the roller C, by being secured in flexible frames d d, which are hinged to sliding plates D, the latter being operated by springs b, as set forth.

66,556.—CAR AXLE.—W. A. Brickill, (assignor to himself and J. A. Sterling,) New York City.

I claim the combination of the supporting pin B, the bored and enlarged inner ends of the two parts A, of the axle and the collars C, substantially as and for the purpose specified.

66,557.—ICE PICK.—James H. Bridgins, Astoria, N. Y.

I claim an improved ice pick made with a suitable handle or holder provided with a series of prongs or picks, substantially as described.

66,558.—MACHINE FOR STRIPPING THE HIDES FROM CATTLE.—Christopher Bruhl, Green Point, N. Y.

I claim the fluted rollers A A, in combination with the adjustable knife E, all arranged substantially in the manner as and for the purpose set forth.

66,559.—GRAIN DRYER.—John Burt, Westport, Mass.

I claim a grain dryer and saver, constructed and operating as herein set forth for the purpose specified.

66,560.—HAND STAMPS.—Dexter H. Chamberlain, West Roxbury, Mass.

1st, I claim mounting the type wheels of a hand stamp on a common axis or shaft to which the latter is secured, an eccentric disk serving as a centre or axis for one of the wheels, whereby wheels of different diameters may be used so that the lower part of their perimeters may be brought to bear in a common plane and in a small compass within the die plate.

2d, I claim the pivoted arm m, in combination with the stud S, and inking ribbon K, for the purpose of enabling the inking ribbon to be slackened when its position is to be changed upon the die plate.

66,561.—HAND STAMP.—Dexter H. Chamberlain, West Roxbury, Mass., assignor to Nathaniel L. Chamberlain, Boston, Mass.

I claim the type wheel b, having figures upon its sides, in combination with an indicator, when the said wheel is arranged between two wheels of smaller diameter as and for the purpose specified.

66,562.—DIES FOR RAISING LETTERS ON TYPE WHEELS.—N. L. Chamberlain, Boston, Mass.

I claim the combination of a tapering plunger e, with the segmental blocks b b, arranged within a die block and having letters or figures sunk on their inner faces as described and with or without the interposition of the inner segment c c, whereby, as the plunger is forced through the center of the die corresponding letters or figures will be formed on the outer face of a ring d, substantially as described.

66,563.—AX.—Daniel W. Colburn, Laomi, Ills.

I claim an ax having its edge shaped as a semi-circle, substantially as and for the purpose described.

66,564.—INVALID BEDSTEAD.—Daniel C. Colby, Washington, D. C.

1st, I claim the combination of the extra frame B, or its equivalent, with the ordinary spring bed bottom when arranged and operating substantially as and for the purposes set forth.

2d, The combination of the rod g', the elastic straps or cords l l, or their equivalent, the bars a a, and the staples j j, as and for the purposes shown.

3d, The use of the rods k k, in conjunction with the bars a a, straps l l, and staples j j, to sustain the frame B, in the various positions shown and described.

66,565.—DEVICE FOR STRETCHING AND DRYING SKINS.—Verplanck Colvin, Albany, N. Y.

1st, I claim the light frame of wire or bamboo or other suitable material braced substantially as shown in drawings, also the rings d d, the teeth e e, and the hook c, for the purpose hereinbefore mentioned, essentially as before shown and described.

2d, I claim the light, portable and adjustable wire or bamboo etc., drying frame and stretcher as aforesaid.

66,566.—BOOT CRIMPING MACHINE.—Heli Conklin, Kirkwood, N. Y.

I claim the form H, with its projections G G, in combination with the arrangement and construction of the machine substantially as described and for the purpose set forth.

66,567.—BED BOTTOM.—Henry A. Cooke, Charlestown, Mass.

I claim the arrangement of slats C C, connected by the rubber strips g g, and bars D D, said bars being provided with the loops a a, for connecting to the bed bottom as herein described and for the purposes set forth.

66,568.—MACHINE FOR MAKING SCREWS.—Edward Croft, Waterbury, Conn.

1st, I claim the revolving and stationary threading dies, when the same shall be constructed and combined substantially as shown for the purposes specified.

2d, In combination with the revolving and stationary dies C D, I claim the knurling dies, when the same shall be constructed and operated substantially as shown for the purposes set forth.

66,569.—MACHINE FOR FORMING WAGON AXLES.—J. E. Cromwell, Jackson, Mich.

I claim the arrangement of the pendent frame T, containing the gear wheels Y Y, and W, pattern N, resting on the gauge pulleys M, the movable frame A, saws and cutters I and H, lever nuts D2, screw feed shaft L, and weights G2, substantially as herein shown and described for the purposes specified.

66,570.—ROTARY STEAM ENGINE.—Jeremiah Darling, Cincinnati, O.

1st, The combination of the semi-circular valves E with their springs F and rollers G, operating as herein described.

2d, I also claim the cylinder when constructed with its valves E, and packings H, and operating against a stationary face plate C, having its eccentric L, guides M, abutments N, all arranged and combined as herein described and for the purposes set forth.

66,571.—CAR COUPLING.—James Depeu, Peekskill, N. Y.

1st, I claim the bar B, provided with hooks f f, in combination with the link C, inclined bottom plate d, and stop h, substantially as described for the purpose specified.

2d, The rock shaft F, in combination with the lever G, and loop or eye m, on bar B, all made and operating substantially as herein shown and described.

3d, A car coupling box and appendages, made and operating substantially as herein shown and described.

66,572.—GATE.—William R. Dugdale, Penn Township, Ind.

I claim combining and applying to gate posts, the attachment of braces, ties and arms, and also of combining and affixing the aforesaid attachments to gates, in the manner and for the uses substantially as herein set forth and described.

66,573.—COMPOUND FOR THE TREATMENT OF OILS FOR LUBRICATING.—Charles J. Eames and Charles A. Seely, New York City.

We claim the compound or preparation herein described for treating oils in the manner and for the purpose described.

66,574.—LOOM.—John Earnshaw, East Greenwich, R. I.

1st, I claim the shuttle T, arranged to operate vertically and crossing the head of the needle so as to interlace the shuttle thread with the filling thread substantially as set forth.

2d, The employment of two or more filling thread carriers in combination with a device for catching and retaining the filling thread at each movement of the filling carriers, substantially as set forth.

3d, A tubular needle or thread carrier constructed and operating substantially in the manner herein set forth.

4th, The notch c, in the shuttle race, in combination with a filling thread carrier and shuttle T, as and for the purpose specified.

5th, The depression E, formed at or near the point of a tubular filling thread carrier, substantially as and for the purpose set forth.

6th, The needle operator L, arranged to operate the filling thread carrier, substantially as described.

66,575.—CLAMP FOR ROPES OR WIRE.—John H. Elward, Mendota, Ill.

I claim a device for suspending a rope or wire, in which its own strain is made to act upon the long arm B2, of the cam lever B, thereby compressing the rope or wire between the short arm B', and a projection C, substantially as set forth.

66,576.—LAMP SHADE.—James Emery, Busksport, Me.

I claim the new manufacture of lamp shade, or the combination of the screen A, and the three pronged carrier B, constructed and applied together substantially in manner as specified.

66,577.—COTTON GIN.—A. Fessenden, Beaufort, S. C.

1st, I claim the roller G, when hung in the swinging plates H, in which it is adjustable up and down, in combination with the adjustable platform F, and adjustable seed clipper I, all made and operating substantially as herein shown and described.

2d, The yielding seed clipper I, when arranged substantially as herein shown and described, with rounded lower edge, in combination with the rollers E and G, of a cotton gin, substantially as and for the purpose herein shown and described.

66,578.—SEED DRILL.—J. P. Fulghum, Milton, Ind.

I claim the adjustable deflecting rack, K, secured either to the hopper, B, or any other part of the drill (and made adjustable by means of the slotted projections, S S, and screws, M M), or their equivalents, substantially in the manner and for the purpose described.

66,579.—GAGE COCK.—Albert Fuller, Brooklyn, N. Y.

I claim the arrangement and combination of the sliding collar, F, interior collar, d, and spring, G, with the body, A, and valve stem, C, said spring having a valvular or closing action at its opposite ends, essentially as shown and described.

66,580.—HYDRANT VALVE.—Albert Fuller, Brooklyn, N. Y.

I claim the valve, I, linked in an eccentric manner, by pin or stud, S, or its equivalent, to the tube, L, by the oscillation of which the valve, I, and waste aperture, m c, are controlled, substantially as set forth.

66,581.—PROCESS FOR MAKING POSITIVE AND NEGATIVE PHOTOGRAPHS IN THE CAMERA.—Franklin B. Gage, St. Johnsbury, Vt.

I claim in photography the employment of diffused light under the conditions herein specified so as to render visible slight gradations of shade both in the light and dark parts of the pictures, and to unite softness with strength, as herein explained and set forth.

66,582.—CLOTHES DRYER.—Henry Gransden, Dubuque, Iowa.

I claim, as a new article of manufacture, a clothes dryer consisting of the sliding sleeve, E, braces, D, pivoted arms, C, flanged band, a, and pole, B, all arranged to operate on the post, A, as herein shown and described.

66,583.—GANG PLOW.—Robert R. Graves, Montgomery, Ala.

I claim, 1st, The combination of the draw beam, C, having the segment spur wheel, c', with the vertical shaft, L, having the spur wheel, i, substantially as and for the purpose described.

2d, The combination of the movable frame, F F, with the shaft, I, wheel, M, endless chain, M', and wheel, m, worked by the crank, m', substantially as and for the purpose specified.

3d, The combination of the rails, K K, springs, k' k', arms, k k, trucks, f f, and frame, F F, substantially as and for the purpose described.

4th, The combination of the rod, N, spring, p', lever, P, and arms, r and r' substantially as and for the purpose specified.

66,584.—HARVESTER RAKE.—J. C. Hall, Monroe, Wis.

I claim operating the rake, C, by means of the curved staff, D, hinged levers, E and F, of different lengths, compound crank, L, and connecting rods, M N, substantially as and for the purpose set forth.

66,585.—SCREW.—H. A. Harvey, New York City.

1st, I claim constructing wood screws of the globular head form with the oblique holes, a a, in the heads thereof, substantially as shown and described in combination with the gimlet pointed screw, as a new article of manufacture.

2d, In combination with a screw thus formed, I claim the screw driver, B, constructed substantially as described for the purposes set forth.

66,586.—BONE HANDLE FOR CANES, ETC.—Joseph Harvey, Philadelphia, Pa., assignor to Harvey & Ford, New York City and Philadelphia, Pa.

I claim the bone handles for parasols, umbrellas, canes, and other articles constructed as described, consisting of the section, B, formed in one piece, sections, C C and D D, attached together by means of the metallic strip, b, covered with cloth, all secured together by means of the screw ferrules, E substantially as described for the purpose specified.

66,587.—HAND TOBACCO CUTTER.—E. K. Haynes, Hanover, N. H.

I claim in combination the finger looped bed piece, the priming lever, and the thumb looped secondary lever, when arranged in combination with a spring and otherwise, substantially as described.

Also, in combination with the foregoing, a receiver and its counterpart, arranged to operate substantially as described.

66,588.—CARPET FASTENER.—L. S. Hicks, Ornro, Wis.

I claim the carpet fastener consisting of the curved plate, B, provided with the inward projecting teeth, C, its inner side, D, attached to the side wall by means of spring plate, E, or equivalent, substantially as described for the purpose specified.

66,589.—TUG TRIMMER.—A. V. Hill, Limestone, N. Y.

1st, I claim the knives, G, and blocks, E and F, in combination with the adjusting screw, C, and frame, A, having a scale marked upon it, substantially as shown and described and for the purpose set forth.

2d, The combination of the roller, I, roller frame, H, and coiled springs, J, with each other and with the frame, A, substantially as herein shown and described and for the purpose set forth.

66,590.—STEAM GENERATOR.—James Howard and E. Tenney Bousfield, Bedford, England. Patented in England Jan. 11, 1867.

1st, We claim the inner tubes, F, provided with the slits near their tops whereby the differential water lever is obtained in combination with the transverse pipes, B, containing divisions, C, as herein described for the purpose specified.

2d, Securing a water-tight joint between the tubes and transverse pipes in the manner above described.

3d, The fire bricks, d d, constructed as described, when employed to fill the spaces between the outer tubes, B, as herein set forth for the purpose specified.

66,591.—DOOR HOLDER.—Edmund Huddart, Prairie du Sac, Wis.

I claim the arrangement of staple and plate, A B, the stud and plate, C D, and the spring, c c, substantially as shown and described for the purposes herein set forth.

66,592.—ANIMAL TRAP.—George Irwin, Elizabethtown, Ky.

I claim, 1st, The combination of the spring drop, I, upright arm or catch, K, horizontal arm, G, and shaft, F, of the outer grate, D, with each other, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the inner spring drop, O, shaft, M, and levers, R and S, and the wire catches, U and X, with each other for the purpose of unlocking the drop gates, substantially as herein shown and described.

3d, Connecting the looped shafts, M and E, to each other by the connecting rod or wire, A', so that the outer drop gate, D, may be opened and set by opening the inner drop gate, L, substantially as herein shown and described.

66,593.—BOILER SAFETY GAGE.—R. H. Jackson (assignor to himself and A. V. Van Tine), Sandusky, Ohio,

I claim, 1st, The pipes, K F and L, as arranged in combination with the cylinders, A and C, and boiler, G, for the purpose and in the manner described.

2d, The valve, O, when arranged and operated by the lever, N, and float, N', when in the relation to the piston, a, substantially as and for the purpose set forth.

66,594.—APPARATUS FOR DRYING LUMBER.—R. P. Johnson (assignor to himself and Eli J. Sumner), Wabash, Ind.

I claim, 1st, The combination and arrangement of the furnace, C, flue, D, and perforated plates, E, by which the products of combustion are discharged directly into the chamber, A, among the lumber being driven through such chamber and discharged through the chimneys, M, as herein described for the purpose specified.

2d, The tubes, N, arranged in relation with the flue, D, whereby the draft through the chamber, A, is accelerated, as herein set forth for the purpose specified.

66,595.—CUPBOARD LATCH.—A. D. Judd, New Haven, Conn.

I claim, 1st, The latch plate, a, having two holes to admit the screw or fulcrum of the latch, b, so as to allow the same to be reversed, as set forth.

2d, The cylindrical flange, e, in combination with the porcelain knob, f, and rivet, I, arranged substantially as and for the purposes set forth.

66,596.—MAGAZINE FIRE-ARM.—E. C. Kirk and E. Sneider, Baltimore, Md.

We claim, 1st, Confining the sliding magazine tube of a repeating fire-arm by means of a spring forming an adjustable detent permitting at pleasure the entire withdrawal of the tube from the gun, substantially in the manner herein set forth.

2d, The combination of an inner longitudinally slotted magazine tube, B, with an inclosing longitudinally grooved or slotted tube, A, and with the feeding mechanism of a repeating fire-arm, all substantially in the manner and for the purpose herein set forth.

3d, The combination and arrangement of slot, a, and offset, g, in the magazine tube, B, with slot or groove, b, and offset, f, in stationary inclosing tube, A, of a repeating fire-arm, for the purpose of automatically retracting and detaining the plunger, C, of the magazine tube, all substantially as herein set forth.

4th, The combination of a guard spring F, with the loading aperture, K, of a magazine tube, B, when said aperture is formed in the side of the tube, substantially in the manner and for the purpose herein set forth.

66,597.—SUBSOIL ATTACHMENT FOR PLOWS.—John A. Krake, Alden, N. Y.

I claim, 1st, The combination and attachment of a subsoil plow to a common plow in such manner that it shall be drawn in the line of draft of the common plow to which it is attached and be free to oscillate right and left and vertically without throwing it out of the line of draft, substantially as described.

2d, The connecting spring, I, applied and used for the purpose and substantially as described.

3d, The spring, J, applied and used in combination with the standard, F and bracket, G, for the purpose and substantially as described.

4th, The bracket, G, having a friction roller, h, as a means of supporting and guiding the standard of the subsoil plow, substantially as described.

66,598.—BEDSTEAD AND BED BOTTOM.—E. Kreighoff, Rochester, N. Y.

I claim, 1st, The combination of the metallic frame inclosing the springs with the rail and revolving pins, substantially as described for the purpose specified.

2d, The combination of the metallic spring frame with the adjustable head rest, substantially as described for the purpose specified.

66,599.—HAIR CURLER.—C. H. Lavis and James McMillan, Philadelphia, Pa.

We claim the stick, A, having a slot, C, formed in one end and an elastic loop, B, attached at the other end, substantially as herein shown and described.

66,600.—WATER ELEVATOR.—S. C. Lewis, Woodbridge, Mich.

I claim the combination of crank, F, spring, N, sliding rod, G, shaft, D, cap, E, and spool, H, with each other, substantially as herein shown and described for the purposes set forth.

66,601.—NAIL.—William E. Lockwood, Philadelphia, Pa.

I claim a nail shaped substantially as represented and having a hole through it with rounded edges, as described.

66,602.—SAWING MACHINE.—J. R. Logan, Bellemore, Ind.

I claim allowing the frame of the machine to conform to any inclination of the log by means of the slotted transverse bar, a, resting on axle, C, provided with pins, h, constructed as described and operating substantially in the manner and for the purpose specified.

66,608.—FELTING MACHINE.—W. A. Lyon, Danbury, Conn.

I claim, 1st, As an improvement in the process of felting hats the rolling of them between a pair of reciprocating beds immersed in hot water, substantially as described.

2d, The combination of the reciprocating beds, a and b, the former mounted on a track in the vat, C, and the latter suspended on the adjustable frame, B, arranged to operate substantially as described.

66,604.—BRICK KILN.—A. S. McBride, St. Louis, Mo.

I clrim, 1st, The arrangement of the series of fire chambers, C, upon each side of the kiln flooring, b, upon which the bricks are stacked between said series of fire chambers and the chimneys, B, at each angle or corner of the kiln, as herein shown and described.

2d, The arrangement of the double series of metallic plates D, upon the pivoted rods, c, the plates of each series overlapping each other, as herein set forth for the purpose specified.

66,605.—BRICK MACHINE.—Charles C. and J. McDermid, Cambria Mills, Mich.

1st, We claim the combination with a positive or cam like action to the lever F, which controls the motion of the follower of a weight to said lever arranged to give pressing power or force to the follower on relief of the lever from its positive lifting action on the follower, substantially as specified.

2d, The combination with the lever F, of the adjustable or sliding weight G, under control of a lever I, and rod I, or their equivalents substantially as and for the purpose or purposes herein set forth.

3d, The pusher or pushing frame J, actuated by a cam-like or positive action in its advance stroke and by a weight or weighted lever in its return stroke, substantially as specified.

4th, The gear of the rod R, which actuates the pusher J, with the weighted lever M, in a loose or independent manner under control of a weight O, essentially as and for the purpose herein set forth.

66,606.—BRUSH FOR MUCILAGE, PAINTING, GLUING, AND OTHER LIKE PURPOSES.—John W. McGill, Washington, D. C.

I claim a brush made by running the hairs or bristles for one half their entire length through the hole, c, in one end of the handle, then doubling down both ends of the hairs or bristles and bringing them into their proper perpendicular position below the end of the handle by running the neck or tube, d, down the handle over the hole, c, for the purposes set forth and described.

66,607.—TEA KETTLE.—Edward McGrann, Louisville, Ky.

I claim the swinging lid, B, having the doubly countersunk orifice, F e e', in the described combination with the bossed orifice, C D, conical headed and screw threaded pivot, F f f' f'', and nut, G, the whole being combined and arranged as set forth.

66,608.—DREDGING MACHINE.—J. H. McLean, St. Louis, Mo.

1st, I claim the dredger, the receiving and discharging apron, and the derrick for raising and lowering the dredger, when these respective plates are combined, constructed, and operated in relation to each other, substantially as described.

2d, In combination with the dredging vessel the pins, L, for the purpose of mooring the same, substantially as described.

66,609.—HARVESTER RAKE.—Jacob Miller, Canton, Ohio.

I claim, 1st, The combination of the swivel post, the sweep rod, fork, and driving arm, with the cam ledges for giving said fork its projecting and retreating motions in connection with its revolving motion, substantially as described.

2d, I also claim in combination with the fork, the post or tang on the driving arm for guiding the ends of the teeth of the fork, and for aiding in moving the grain from the platform, substantially as described.

66,610.—COAL STOVE.—George R. Moore, Lyons, Iowa.

I claim, 1st, In a heating stove the hearth, E, constructed as shown, and applied substantially in the manner and for the purposes specified.

2d, The bar or fulcrum, F, when used as a part of a stove or heater, substantially in the manner and for the purposes specified and set forth.

66,611.—CLOTHES BROOM OR WHISK.—Bernard Moraham, Brooklyn, N. Y.

I claim the combination of the scraper or rubber, A, or the equivalent thereof with a clothes brush or broom, substantially as and for the purposes described.

66,612.—BRUSH HOLDER.—Bernard Moraham, Brooklyn, N. Y.

I claim the frame, A, having an adjustable clamping jaw, G, screw socket, B, and nut, E, for the purpose and substantially as described.

66,613.—SUBMARINE TELEGRAPH CABLE.—S. E. and G. L. Morse, Harrison, N. J.

We claim, 1st, Laying a submarine telegraphic cable at assigned places on the line, over a floating body and then after the catenarian curves on each side are fully formed depositing the part of the cable included in these curves, on the bottom of the sea, at right angles or at nearly right angles with the main line so that it may be raised unbroken to the surface from deep water, substantially as described.

2d, The formation of a floating buoy whose lower, larger and more buoyant part shall always be in deep and comparatively still water, below the violent action of the waves, while the upper part which is to pass through and rise above the waves shall present a small surface to their destructive power.

3d, The combination of a sliding ring a lifting rope, a guiding wire or rope, and a hook with a barbed shank to lift a cable or weight in the water, substantially as described.

4th, The combination of a sliding ring a buoy or buoys loaded with a weight that sinks them, a guiding wire, a hook with a barbed shank, and an apparatus to attach the weight at the proper time from the buoy or buoys, to raise a cable or other body in the water.

5th, We also claim the hook, f, in combination with the tube bar hinged clasp, E, substantially as set forth.

6th, We also claim the combination of a rope, H, with hollow glass vessels fastened and incorporated therein so as to diminish the specific gravity of said rope, substantially as described.

7th, We also claim protecting the hollow glass vessels by casings of wood or other suitable material, and passing strands of the the rope over the casings in grooves made for the purpose substantially as described.

8th, We also claim connecting a buoy anchoring rope or a guiding rope with its encased buoys, and its floating buoy, by cushioned ferrules with projecting cushions to diminish the liability to wear at these points from the action of the wave on the floating buoy, substantially as described.

66,614.—BAG HOLDER.—E. S. Molton, Plymouth, Mich.

I claim the arrangement of the looped hoop, C, and cross-piece, E, when said loop is connected to the cross-piece by means of the braces, G G, for supporting the bag and secured upon the standard, A, by means of the eccentric lever, H, and bar, F, as set forth.

66,615.—STEERING APPARATUS.—T. W. Murray, New York.

I claim the collar, C, provided with the recesses, a, and fitted on and firmly secured to the rudder post, in combination with the pivoted dog, b, secured to the deck of the vessel or to a suitable plate or stock attached thereto, substantially as and for the purpose specified.

I further claim the steering apparatus arranged with the pendent toothed segment, D, on the rudder post with the pinion, E, gearing into it underneath, substantially as and for the purpose set forth.

66,616.—EXTRACT OF SEA CLAMS.—B. G. Noble, New York.

I claim reducing by evaporation the liquor or juice of sea clams, either alone or in combination with other alimentary material to a state of dryness, substantially as and for the purposes herein set forth.

2d, I claim as a new manufacture solidified extract of sea-clams substantially as herein specified.

66,617.—GOVERNOR.—F. J. Nutz, and Philip Estes, Leavenworth, Kan.

1st, We claim the governor valve operated upon by the pressure of the steam pressing upon the piston and rod, E, and lever, C, producing an effect substantially as described for the purpose specified.

2, We claim the spring, F, with its regulating thumb screw, J, arranged substantially as and for the purpose set forth.

3d, We claim the arrangement of the eccentric, H, whereby the governor valve can be entirely closed and the steam throttled, substantially as described.

4th, We claim the stop motion substantially as shown in fig. 2, whereby the steam is shut off and the engine stopped by the breaking or running off of the governor belt, substantially as set forth.

66,618.—LOCOMOTIVE ASH PAN.—A. Ohlenslager, Jersey City N. J., assignor to H. L. Lansing and G. H. Chase, Buffalo, N. Y.

1st, I claim a locomotive ash pan provided with openings, b b, through the bottom and a corresponding gate or disk plate, m, which may be moved and placed in a manner to entirely close such openings when the locomotive is running and opened for the discharge of the ashes and cinders at the proper time and place, substantially as and for the purposes set forth.

2d, An ash pan for locomotives divided into compartments having sloping sides, a a, for the purposes and substantially as described.

3d, The draft flue, B, passing centrally through the ash pan and the adjustable valve cap, D, and the inner inverted conical cap, D arranged and operating for the purposes and substantially as described.

4th, The rock shaft, d2, arranged in the recesses formed under the inclined sides, in combination with the vartical stem, C, and connecting link, I, as a means of raising and lowering the valve cap, substantially as described.

66,619.—SPICE GRATER.—H. W. Oliver, New Haven, Ct., assignor to M. H. Thorpe, Danbury, Ct.

I claim the tubes, a, more or less in number arranged and combined substantially as shown and described for the purposes specified, in combination with the tubes, a, I claim the method herein shown and described for feeding the spice to the grinding plate, I claim the flanged plate, e, the spring, k, and the index n, for the purposes set forth.

I claim the grinding plate, O, in combination with the tubes, a, I claim the case, S, in combination with the spice mill constructed substantially as described for the purpose set forth.

66,620.—COOKING STOVE.—D. E. Paris, Troy, N. Y.

1st, I claim a reservoir or heater tank situated in front of a diving flue cooking stove or range or placed and attached that it shall form the front wall or outer casing of the fire box or the ash way below the fire box or both for the purpose herein set forth, and in the manner set forth.

2d, I claim the ash chamber in front of and below the fire box covered by a water reservoir or tank in combination with door openings into said chamber at the lower front of the reservoir, substantially as here shown and described.

3d, I claim an opening through the front part of the stove top or through the hearth plate of the stone in combination with the open topped reservoir as herein shown and described.

4th, I claim a bail stone boiler, vessels, or kettles, so constructed that one end of said bail will operate on a shank or prong of the cover to said vessels so as to move it off its place and then on again horizontally by the shifting of the bail from side to side.

66,621.—HORSE HAY FORK.—S. W. Patterson and S. Dewey, Malnesburg, Pa.

We claim the metallic head or box, H, constructed and applied to the lever, B, as described and affording a bearing for the pulleys, A and R, as and for the purpose set forth.

66,622.—CARBURETING AIR.—J. C. Pedrick, Washington, D. C.

I claim feeding in or supplying air to carbureters or carbureting chambers by the means and substantially as herein recited.

66,623.—MECHANICAL MOVEMENT.—J. H. Pelton, Cleveland, Tenn.

I claim the arrangement of hand and foot levers, I I and J J, pitman, I I J J' and doubly crank shaft, B, for the purpose set forth.

66,624.—SELF-BAILING SURF AND LIFE BOAT.—Norwood Penrose, Philadelphia, Pa.

1st, I claim in a self-righting and bailing surf and life boat provided with a heavy keel and elevated buoyant ends in the usual manner, the amidships trunk or well, A, in combination with a deck or floor, E, and any suitable automatic valve, a', at its upper end, the said trunk or well, A, passing vertically downward through the kelson and the keel of the boat, substantially as described and set forth for the purpose specified.

2d, I claim in a self-righting and bailing surf and life boat provided with a heavy keel and elevated buoyant ends in the usual manner, the oblique trunks, B B', in combination with a deck or floor, E, and any suitable automatic valves at their upper ends, the said oblique trunks extending from the starboard and larboard sides respectively of the floor or deck, and opening into a vertical trunk or well, A, at points just above the kelson of the boat, so as to discharge their water vertically through the keel of the boat, substantially as described and set forth.

3d, I also claim in combination with a self-righting and bailing and surf boat, the air-containing elastic cases, D, the same being constructed as described, and applied within the respective compartments and bulkheads of the boat, as and for the purpose specified.

66,625.—HARVESTER RAKE.—G. M. Peters, Granville, Ohio.

1st, I claim a reciprocating and turning rake, operated from beneath through a slotted platform, and arranged to move in a path parallel to the finger bar during a part of its delivery stroke, and then to turn and sweep the grain from the platform in the arc of a circle, the center of which is at or near the outer corner of said platform, substantially as described.

2d, A grain platform, slotted as described, in combination with a reciprocating and turning rake, operating from underneath, and delivering the grain in rear of the inner or main frame end of said platform, substantially as described.

3d, The reciprocating turning rake in combination with the lever, J, and slotted sliding lever, L, operated as described.

4th, The reciprocating rod, O', working underneath the rear edge of the platform in guides, o' o', in combination with connecting rods or links, o o2, and slotted lever, L, as described.

5th, The rake lever, L, provided with the spur and friction roller as described, whereby a vertical reciprocation is imparted to said rake lever through the medium of ways or tracks, M N O, and latches, m1 m2, or their equivalents, for the purpose specified.

66,626.—MACHINE FOR MAKING BUTT HINGES.—Adrian Raris (assignor to the Scoville Manufacturing Co.), Waterbury, Conn.

1st, I claim the closing and opening wings, I, in combination with the milling disks, H, constructed and operating substantially as and for the purpose herein described.

2d, The guide caps, b, in combination with the milling disks, H, and the slides, C3, constructed and operating substantially as and for the purposes herein described.

3d, The lever clamps, d, and inclined cross bar, e, in combination with the slides, C3, and the milling disks, H, constructed and operating substantially as and for the purposes herein described.

4th, The clamp, P, and the guides, h, in combination with the wings, I, constructed and operating substantially as and for the purpose herein described.

5th, The slide, C5, and nail punch, m, in combination with the wings, I, and the guides, h, constructed and operating substantially as herein described.

6th, The combination of the feeding boxes, bending dies, milling disks, closing and opening wings, joint clamp, knuckle guides, and nail punch, constructed as described.

66,627.—COMBINED SEEDER AND CULTIVATOR.—B. W. Remy, Brookville, Ind.

I claim the main frame composed of the vertical arched iron bars, C D, and the horizontal frame, F, also made of iron bars, and the whole combined with the short axles, B B, by which it is supported in the carrying wheels, substantially as and for the purpose described.

I also claim, in combination with the main frame composed of iron bars or straps and supports as described, the pivoted bars, H I, to which a cultivator or seeding mechanism, substantially such as described, may be attached, as and for the purpose set forth.

66,628.—GRATE FOR FURNACES.—Jesse Reynolds, Philadelphia, Pa.

I claim the bearer, C, with its groove, e, and openings, 11, in combination with the recessed bearer, C1, the whole being arranged with a fire place for the reception of the grate bars, substantially as described.

66,629.—SCREW TAP.—J. F. C. Rider and G. B. Wiggin, South New Market, N. H.

We claim the combination of the ring, F, with cams, B B B B, the mandrel, G, with cams, D D D D, and cutters, C C C C, or its equivalent, substantially as shown and described, so that by turning ring F, by handle E, the cutters of the tap will be released from the thread in the hole, and thus allow the tool to be withdrawn as specified.

66,630.—MODE OF COATING WROUGHT IRON OR CAST IRON WITH A HARDER METAL.—James Rigg, Iowa Falls, Iowa.

I claim coating wrought or cast iron with a harder metal by first applying a suitable flux and afterward dipping it while hot into a harder metal in a molten state, as herein shown and described.

66,631.—HINGING TEA-KETTLE COVERS.—Ezra Ripley, Troy, N. Y.

I claim an edgewise swinging cover, hinged or pivoted to a tea kettle at one side of the line of its spout, and furnished with a stop, so that the cover can be swung off in a direction at first rearward or away from the spout, and that the weight or gravity of the cover when closed keeps or tends to keep the cover from swinging partly off when the tea kettle is inclined forward and tilted sideways, substantially as herein set forth.

I also claim a tea kettle having an edgewise swinging cover, and a bail hinged to lugs in line or nearly so with the spout of the tea kettle, and so constructed that the cover can be swung off over the rear bail lug, substantially as herein set forth.

66,632.—UMBRELLA.—Horace B. Robbins, Boston, Mass.

1st, I claim providing umbrellas with auxiliary braces, a a, and for the purpose specified.

2d, The combination of the runner, b, braces, a, and ribs, D, substantially as described.

3d, The arrangement of the stretchers, F, having slots, h, with the braces, a, substantially as described.

66,633.—GUDGEON FOR BOOMS.—Nathaniel Robbins, Jr., Rockport, Mass.

1st, I claim the use of the socket, D, and the pintle, E, as a bearing for a boom and connection with the mast, substantially as described.

2d, The construction and arrangement of the boom joint or connection, substantially as described.

66,634.—WINDLASS.—Nathaniel Robbins, Jr., Rockport, Mass.

1st, I claim the combination of the drawn, f, with the section, e e, the whole arranged with falls and brakes in connection with a windlass, substantially as described.

2d, The use of the gear wheels, i j k and e, in combination with the arms, h and m, and the drawn, f, substantially as and for the purposes set forth.

66,635.—LAMP BURNER.—W. Robinson, Funkville, Pa.

1st, I claim the construction of inclined planes, so arranged with respect to the cone and shell of a lamp burner, as to raise and lower the cone for adjustment vertically.

2d, The mode of adjusting the cone by means of inclined planes, e e, operating substantially as herein described.

66,636.—ASH TUB OR LEACH.—C. Roop, Middletown, Pa.

I claim an ash tub or box constructed and arranged substantially as herein specified.

66,637.—ADVERTISING APPARATUS.—J. A. Royce, Lee, Mass.

1st, I claim the endless band, E, furnished with suspended cards or tags, F, in combination with the openings, e, of the ceiling, d, substantially as and for the purpose specified.

2d, The wheel, C, constructed with radial floats, and arranged at or upon the roof of the car, in combination with the endless band, E, furnished with cards or tags, substantially as herein set forth for the purpose specified.

3d, The case, B, open at both ends, arranged upon the roof of the car and in relation with the wheel, C, substantially as herein set forth for the purpose specified.

4th, The wheel, C, pulleys, b, and belts, c, arranged in relation with each other and with the rollers, D, endless band, E, openings, e, and cards or tags, F, substantially as herein set forth for the purpose specified.

66,638.—SAFETY POCKET.—Fisk Russell, Cambridge, Mass.

1st, I claim a safety or armored pocket, the mouth of which is secured by a hasp which is sprung into a lock, substantially as described.

2d, Also so arranging the hasp that it may slide in lateral directions in the lock to enable the respective parts of the pocket to yield freely, substantially as set forth.

3d, Also in combination with the lock and hasp, constructed to operate as described, a spring bolt for locking the hasp in position, said bolt being thrown forward by tripping a catch and thrown back by a key, substantially as set forth.

4th, Also the arrangement together of a safety pocket, locking as described, and an ordinary pocket.

66,639.—MOP WRINGER.—H. Russell, New Richmond, Wis.

1st, I claim a machine for wringing water from mops consisting of a press box which is adapted for receiving a mop when applied to its handles, a follower for pressing the mop, and a movable lever for acting upon the follower, all being constructed and operated substantially as described.

2d, The construction of the frame and its press box for the purpose of receiving the mop and pressing devices, substantially as described.

66,640.—MACHINE FOR DRESSING HIDES AND SKINS.—John Schiffer (assignor to himself and Meyer & Mueller), New York City.

1st, I claim the bed, a', fitted with the clamps, r r', in the manner specified, in combination with the rotary scraper, c, formed with diverging blades, as and for the purposes set forth.

3d, I claim the bed, o, having an elastic surface upon which the hide or skin is to be laid, in combination with the rotary scraper, c, substantially as and for the purposes set forth.

5d, I claim the levers, s and n, and frame, n, in combination with the bed, o, as and for the purposes set forth.

4th, I claim the bolts, p p, and pinions, 3 3, in combination with the chains, x x, and frame, n, for the purposes and as set forth.

66,641.—Lathe Tool.—J. C. Shackleton, Lawrence, Mass.

I claim the combination of the tool holder, A B, tool, C, and set screws, e, when constructed and arranged as herein set forth

66,642.—Machine for Making Horseshoe Nails.—Wm. Sherts, Hudson, N. Y.

1st, I claim the anvil, G, constructed as described, in combination with the hammers, C and D, substantially as and for the purpose specified.

2d, Imparting to the anvil, G, a sliding movement with reference to the hammers and the nail rods, as described, during the foregoing operation, substantially as and for the purpose specified.

3d, The gripping jaws arranged upon the sliding plate, I, and in relation with the sliding anvil, G and the jaws, d' e', of the feeding tongs, substantially as and for the purpose herein set forth.

4th The cam wheel, A, with the several series of cams, a b, plain circumferential portion, c, and semicular ribs, d, in combination with the three hammers, C D, all constructed and arranged substantially as and for the purpose specified.

5th, The cutters, M N f', in combination with the system of levers and the wheel A, all constructed and arranged substantially as and for the purpose specified.

6th, The sliding bar, H, provided with the spur, h', and the levers, s u, arranged in combination with each other and with the slide, H, and the radial spur, n2, of the wheel, A, for the purpose of operating the jaws, d' e', of the feeding jaws or mechanism, substantially as and for the purpose specified.

7th, The combination of the spring catch, e', rod, c', sliding gripping jaw, s', and the vertically moving slide, K, substantially as and for the purpose specified.

8th, The sliding rod, c', spring catch, a', stud, b', arranged in relation with each other and with the sliding plate, I, sliding gripping pan, s', and spring catch, e', substantially as and for the purpose specified.

66,643.—Boot Jack, Wrench, and Nail Pull.—Otis Shepard, Alton, Ill.

I claim a boot jack provided with the tack extractor, c, wrenches, D, upon its sides, E and F, saw sets, H, and wagon wrench, I, in the support, H', as herein shown and described.

66,644.—Concussion Fuse for Explosive Shells.—A. J. Simpson, Philadelphia, Pa., and J. J. Janezeck, Washington, D. C.

We claim in combination with the tapering closed case, A, the plunger, D, fitting snugly therein, the fulminate chamber, B, fulminate tube, C, friction wire, b, washer, c, pin, d, and powder chamber, e, all arranged therein and constructed as herein described and for the purpose specified.

66,645.—Petroleum Filter.—J. H. Smith, Pittsburgh, Pa.

I claim the perforated distributing spout, a, filter, B, troughs, C, distributing spout, c, and filtering platform, D, all arranged in relation with each other and with the tanks, A E, in such manner that the oil may be filtered and evaporated by passing from a fine shower to sluggish streams, as and for the purpose specified.

66,646.—Churn.—Wm. C. Smith, Yantic, Ct.

I claim the connecting of the shafts, C C, of the gears, D D, to the shafts, a, of the beaters, by means of the pins, E, in said shafts, arranged with the springs, f, the sockets at the ends of the beater shafts, and the squares or dovetails, c, on the inner ends of the gear shafts, C, to fit into the sockets on the shafts, a, substantially as and for the purpose specified.

I also claim the butter worker, H, constructed as described, in combination with the churn, A, and right or flexible dead eye, G, as herein set forth for the purpose specified.

66,647.—Mop Wringer.—A. G. Starkweather, Burlington, Vt.

I claim the roller frames, A and D, constructed and combined with each other, and secured to the pail, substantially in the manner herein shown and described and for the purpose set forth.

66,648.—Car Starting Apparatus.—Joseph Steger, New York City.

1st, I claim the gearing device consisting of the spring, P S, provided with a foot button, and the ratchet, R, suspended from said spring, substantially in the manner and for the purpose specified.

2d, The car starting device consisting of the traction bar, T, lever, L, pivoted ratchet, R, ratchet wheel, W, spiral spring, S, and spring, P S, constructed and arranged substantially as herein specified.

66,649.—Carpet Stretcher.—W. H. Taylor, Newark, N. J.

1st, I claim the combination of the floor plate, A, toggle levers, B C, and tail block, G, with each other, substantially as herein shown and described and for the purpose set forth.

2d, Attaching the tail block, G, to the lever, C, by means of the adjusting screw, E, and nut, F, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the movable lever jaws, I, with the arms or stationary jaws, a', of the floor plate, A, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the thumb screws, J, with the movable lever jaws, I, and floor plate, A, substantially as herein shown and described, and for the purpose set forth.

66,650.—Composition of Matters for Disinfecting and Preparing Fertilizers.—John A. Thompson, Auburn, N. Y.

1st, I claim the within-described composition of matter, consisting of charcoal charged with sulphurous acid, or other disinfecting gas, and gypsum, combined and prepared substantially as described and for the purposes set forth.

2d, I also claim the combination of the above-described compound with animal or vegetable substances, to produce a fertilizing material, whether with or without the addition of common salt, wood ashes, bone dust, or other fertilizing ingredients.

66,651.—Water Wheel.—John Todd, Bellefonte, Pa.

I claim, in combination with a water wheel and a curb arranged concentrically around the outside of it, and furnished with chutes leading to the wheel, as represented, a band at G, placed around the outer circumference of the curb, furnished with gates, I, operated to change the areas of the chutes or water ways, as described and represented.

66,652.—Tool.—Sylvester L. Tracy (assignor to himself and Henry Merritt), Cleveland, Ohio.

I claim the improved implement, herein described, as a new article of manufacture.

66,653.—Piano.—George Trayser, Indianapolis, Ind.

1st, I claim the lattice frame work, c c c and d d d, composing the reverberating chambers, F F F, in combination with the top casing, D, and bottom casing E, substantially as set forth.

2d, The manner of producing a convex sounding board by means of the curved surface of the ribs, n n n, as and for the purpose described.

3d, The bed plate, B, when constructed with recesses to receive wooden bridges, a', and with a central cross brace, B', said parts being arranged in relation to each other and the other parts of the bed plate, substantially as set forth.

4th, The angular brace, G, curved brace, G', combined with each other, and attached to a convex sounding board constructed and applied as and for the purposes set forth.

66,654.—Printing Machine.—S. D. Tucker, New York City.

I claim the lever, N or Y, or both, and adjusting screw, O or Z, or both, or their respective equivalents, when arranged to regulate the upward pressure of the rollers, E or Q, or both, against the distributing surfaces, substantially as described.

I also claim the lever, N or Y, or both, when provided with foot-plates, or their equivalents, as and for the purpose described.

66,655.—Ladder.—Benjamin F. Turner, Bridgeton, N. J.

I claim the arrangement of three separate ladders, or lengths, connected together with cross rods, e, working in slots, d d, in the ends, and recesses, k k, at the extremeties, fitted on the first round, b, to be employed in the several applications and positions, separately or combined, in the manner herein described.

66,656.—Method of Manufacturing Faucets.—William Westlake, Brooklyn, N. Y.

I claim the method herein described of making faucets or cocks partly of cast iron and partly of sheet brass, substantially as specified.

66,657.—Method of Manufacturing Faucets.—William Westlake, Brooklyn, N. Y.

1st, I claim the method of making faucets or cocks partly of sheet metal and partly of cast metal substantially as described.

2d, I also claim faucets or cocks constructed in the method herein described as a new article of manufacture.

66,658.—Uniting the Ends of Lead Pipes.—Nathan Foster Weston, Boston, Mass.

I claim the device for uniting the ends of lead pipes and dispensing with the use of solder, consisting of the hollow expanding plug A, sleeves c c', and nut c, combined and operating together, substantially as before described.

66,659.—Coupling Faucets to Pipes.—Nathan Foster Weston, Boston, Mass.

I claim the mode substantially as above described of applying a faucet or T to a pipe by which the use of soldering is dispensed with and other advantages gained essentially as explained.

66,660.—Washing Machine.—Chas. B. White, Candor, N. Y.

1st, I claim the series of rollers c, mounted in the frame H, pivoted at one end and having its opposite end supported by the springs p, substantially as described.

2d, The rubber block m, mounted in a suitable frame and suspended on the rods b, attached to the spring a, above and connected to the treadle or lever T, below substantially as shown and described.

66,661.—Dredging Box.—Thomas Williams, Boston, Mass.

I claim in combination with the body and perforated cover of a dredge box a perforated inwardly projecting hollow conical or pointed body c, arranged to operate substantially as described.

Also in combination with the body and perforated cover of a dredge box a perforated hollow body interposed between said cover and the contents of said body, when provided with asperities, substantially as and for the purpose specified.

66,662.—Burglar Alarm Gun.—John Wilson, Anderson Court House, S. C.

1st, I claim the arms G G, when pivoted as shown and when provided with pins l and m m, in combination with the springs H H, all made and operating substantially as herein shown and described.

2d, The gun E, when secured to a shaft B, in combination with the disk b, and spring catch c, substantially as set forth.

3d, The plate F, when secured loose on the shaft B, and when notched as shown and provided with a pin k, in combination with the pins l l, on the arms G, all made and operating substantially as set forth.

4th, The trigger e', when provided with a downward projection p, in combination with the pins m, as set forth.

5th, The arms, G, when connected with the wires, o, so that by pulling on or touching the wire the arms, G, will be moved and will serve to revolve the gun and direct it toward the disturbed wire and discharge the same, all as set forth.

6th, An alarm gun made and operating substantially as herein shown and described.

66,663.—Gate.—Ebenezer Young, Camden Center, Mich.

We claim the combination of the upright bar, D, pivoted bar, E, lever G, and pivoted bar, F, with each other and with the gate, C, substantially as herein shown and described and for the purpose set forth.

66,664.—Plastering Machine.—Josiah Keene, Washington, D. C.

I claim the combination of a mortar box, C, with a stand or frame having adjustable and extension guide ways, or standards, substantially as and for the purpose herein specified.

I also claim forcing the follower forward by the movement of the mortar box itself by means of a stationary rack or racks, D K, and a traveling pinion or pinions substantially as and for the purposes herein set forth.

I also claim the extensible way standards, B C, and stationary racks, D E, connected and retained in their extended positions, substantially as and for the purposes herein specified.

I also claim the combination of the adjustable points or dogs for holding the stand in position and the casters or wheels on which it is moved, substantially as specified.

I also claim the combination and arrangement of the windlass or winding shaft, F, and cord, f, for the purpose of raising the mortar box, substantially as herein specified.

I also claim a trowel, I, adjustable transversely to the machine, substantially as herein set forth.

I also claim the arrangement of the trowel, I, so as to have a separate movement upward in front of the mortar box in combination with the springs, T T, and catch, o, constructed and operated as described and for the purpose set forth.

I also claim the stand or frame, V, in combination with the plastering machine set forth, constructed and operating as described and for the purpose herein specified.

66,665.—Anchor.—G. A. Lloyd, and C. A. Stewart, San Francisco, Cal.

We claim the lugs, a a, on the flukes in combination with the stops or projections, d d, on the shank for the purposes set forth.

We also claim making the flukes to stand at different angles so that one will catch first when the anchor is one side up and the opposite one when the anchor is the other side up, substantially as described.

66,666.—Preserving Storing and Transporting Fruits Vegetables, and other Perishable Articles.—Reiter, Westchester, Pa.

I claim the herein described process of preserving and transporting perishable articles, said process consisting in placing inside the box, crate, barrel or car or other closed vessel in which the articles are placed for preservation and transportion, a water tight metallic vessel or its equivalent filled with ice or ice and salt or their equivalent, substantially as described.

Reissues.

2,669.—Magazine Fire Arms.—Valentine Fogerty, West Roxbury, Royal E. Robbins and Frank W. Andrews, Boston, Mass., assignees by mesne assignments of Valentine Fogerty. Patented Feb. 21, 1865.

We claim for use in a breech loading fire arm a divided or notched magazine or cartridge receiving-tube constructed to operate substantially as set forth.

2,670.—Machine for Cutting Paper.—Hervey Law, New York City. Patented Sept. 18, 1856.

I claim the combination of the rising and falling platform C, the clamp frame E, operating to clamp the paper or book as the platform rises, and to unclamp the same as the platform descends, by means of two double cams or toggles F F, having cranks G G, connected with them, the pintles of which work in curved grooves or otherwise actuated by any well-known mechanical device, substantially as and for the purpose set forth.

2,671.—Snow Plow.—Samuel Richards, Philadelphia, Pa. Patented April 15, 1856.

1st, I claim the long inclined plane for raising the snow gradually mounted upon two swiveling trucks with the lateral acting wedge elevated above the level of the surrounding snow and located on one side of the inclined plane in the position shown in Figure 1, for discharging the snow on double track roads.

2d, The inclined plane for raising the snow arranged so as to be adjustable up and down the plane and from side to side substantially as described.

2,672.—Snow Plow.—Samuel Richards, Philadelphia, Pa. Patented May 13, 1856.

1st, I claim the combination of a long inclined plane, B, mounted upon two swiveling trucks, the wedge piece, F, mounted upon said inclined plane with the point located above the level of the surrounding snow, so that the snow shall be elevated gradually by the plane, B, at or near the level of the surrounding snow before it is pressed laterally by the wedge.

2d, The wedge piece, F, so arranged as to be movable up and down the inclined plane.

2,673.—Toy Tops.—F. O. and W. W. Tucker, West Meriden, Conn., assignees by mesne assignments of themselves. Patented June 12, 1866.

We claim the combination of the whirling spindle, F, with the two cords, L and P, when they are constructed, arranged and fitted for spinning or whirling the tops, substantially as herein described and set forth.

2,674.—Scissors Sharpener.—Henry D. Ward, and William A Richardson, Worcester, Mass., assignees by mesne assignments of A. W. Gilfdrd. Patented Feb. 12, 1867.

We claim a scissors sharpener constructed substantially as described, of a serrated bar or file, B, in combination with and arranged between sides or guides, D C, of a frame or holder for use as specified.

2,675.—Safety Valve.—Henry Waterman, Hudson, N. Y. Patented Nov. 15, 1853.

1st, I claim the piston, F, attached to the weighted end of the valve lever, within the cylinder, G, and immersed in the liquid in the cylinder combined, operating in the manner and for the purpose herein described.

2d, I also claim the concentric rim or ledge, l l, and the overhanging part of valve, k k, constructed, combined, and operating in the manner and for the purpose herein set forth.

2,676.—Wood-planing Machine.—Joel Whitney, Winchester, Mass. Patented April 13, 1852. Extended seven years.

1st, I claim, in combination with a pair of feed rolls, one of which is yielding and the other is not, a pair of intermediate gears, one of which is fixed and the other is not, substantially as and for the purpose described.

2d, I also claim, in combination with a pair of feed rollers, geared and driven from both of their ends, and the duplicate sets of intermediate gears working in and with them, the connecting of said intermediate or driving gears by substantial shafts extending clear across from one set to the opposite set by which the lifting and driving is done at both ends of the rolls, and the twisting, bending, or straining of journals or bearings avoided, substantially as described.

2,677.—Bed Bottom.—George L. Gerard, New Haven, Conn. Patented March 26, 1867

I claim the combination of the clamp bolt, D, with the spring, A, and the bar, C, constructed so as to operate in the manner described.

2,678.—Lamp.—Thomas S. Williams and P. S. Page, Boston, Mass. Patented May 19, 1863.

We claim, 1st, The case or socket, A, in combination with a railroad car lamp or lamp fountain, C, substantially as and for the purpose specified.

2d, The springs, B, or equivalent guides or bearings, arranged between the lamp or lamp fountain and attached to either substantially as and for the purpose set forth.

3d, Projections, c, arranged in the case or socket, A, substantially as and for the purpose specified.

Designs.

2,694, 2,695, 2,696.—Cook's Stove.—G. W. Ball, Cincinnati, Ohio. Three patents.

2,697.—Trade Mark.—Isaac Cook, St. Louis, Mo.

2,698.—Burial Case or Coffin.—E. S. Earley, Philadelphia, Pa.

2,699.—Label for Bottles.—C. Gautier, Washington, D. C.

2,700.—Stove Plate.—Luther W. Harwood (assignor to Fuller, Warren & Co.), Troy, N. Y.

2,701, 2,702.—Rim Lock.—E. M. Mix, Westfield, N. Y. Two patents.

2,703.—Back Piece of a Stave Machine.—Owen Redmond, Rochester, N. Y.

2,704.—Group of Statuary.—John Rogers, New York City.

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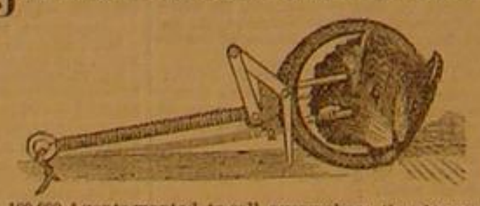
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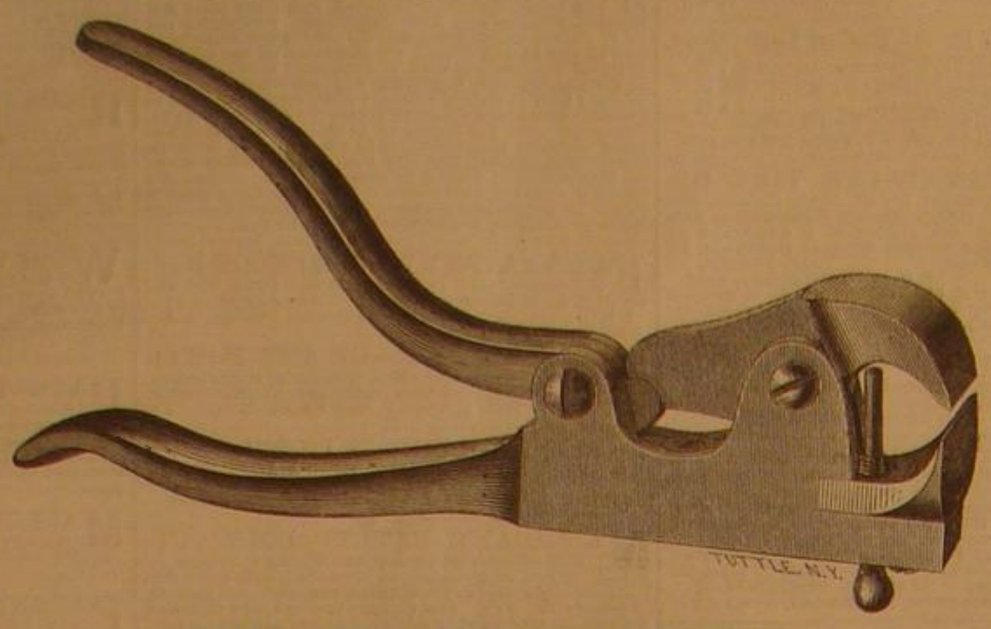
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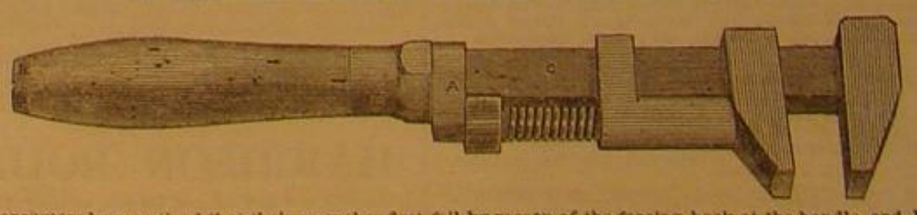
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