Scientific American.

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

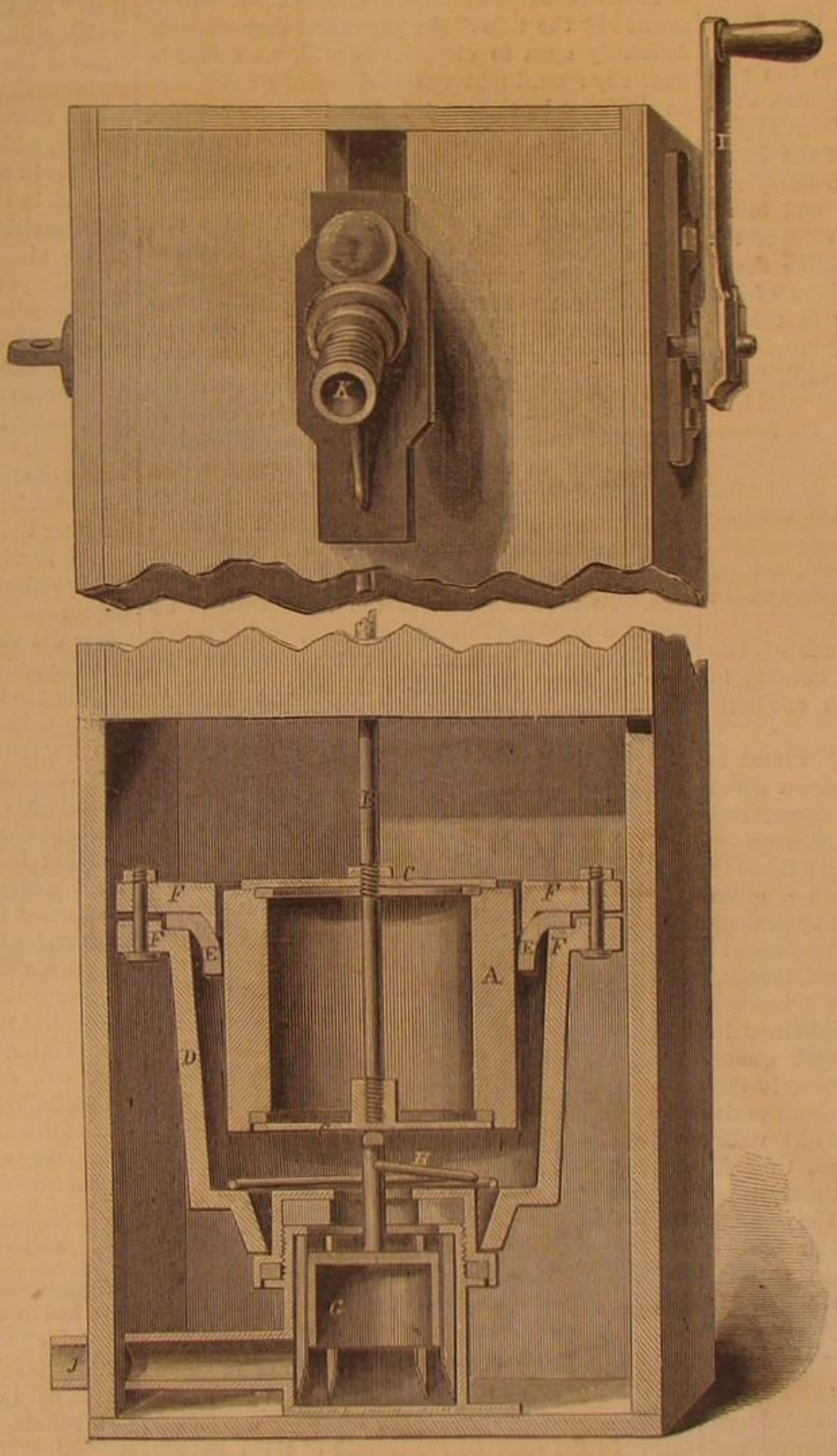
Vol. XV.—No. 11. [NEW SERIES.] NEW YORK, SEPTEMBER 8, 1866. $3 per Annum, [IN ADVANCE.]

Non-Freezing and Non-Wasting Hydrant.

Street hydrants not unfrequently freeze up in consequence of the waste water collecting around the working parts, and these parts are continually wearing from the action of the gritty particles in the water, and thus causing the evil of leakage. Again, the constituent elements of some water act on metals, which derives an unwholesome property from them. The intention of the inventor of the hydrant herewith illustrated, is to obviate these difficulties, and he appears to have admirably succeeded. It is approved by the Water Board of Baltimore, where seven thousand of them are in use. One gentleman states that one of these hydrants has been in use on his premises for seven years, and has never frozen, nor required any expense for repairs.

The plunger, A, is a cylinder of terra cotta, or earthenware, with a glazed vitreous surface, secured to the rod, B, by means of the heads, C, packed with disks of rubber. It works in the case, D, and is made air and water-tight by means of the annular packing, E, secured between the rims, F. The valve, G, is cup-shaped, and has a stem projecting upward into the case, D, and is furnished at its top with a rubber disk, which closes the central aperture in the bottom of the case. A coiled spiral spring, H, retains it firmly in place. The packing, E, is covered with powdered soapstone, applied by means of warm gum. When water is to be drawn, the handle, I, is turned, which screws down the cylindrical plunger, A, on the stem, and depresses the valve, G. The water then enters the pipe, J, and the case, D, discharging through a pipe, its mouth shown at K.

The action of the spring, H, when the pressure exerted by the handle and screw is relaxed, is assisted by the upward force of the water, so that a close joint is at all times assured. The same pressure of water against the lips of the packing, E, increases the pressure of the packing against the plunger. Whatever gritty substances may be in the water are held by the packing, and do not injure the vitreous surface of the plunger. The taste of the water cannot be affected by the earthenware. All the working parts are readily accessible. They can, if necessary, be taken out and replaced, at any time, without breaking the ground, by means of a tool made for the purpose.



CLARK'S NON-FREEZING AND NON-WASTING HYDRANT.

Patented Sept. 3, 1861, by Lewis P. Clark. For manufacturing, State, or city rights, apply to G. W. Brooks, 248 Lee street, Baltimore, Md.

RULES ON THE METRIC SYSTEM.—A correspondent suggests that some of the manufacturers of carpenters' rules make a half-meter rule, folding in two. Closed, it would be two and a-half decimeters, and open, five decimeters, or 19.685 inches. It should be graduated to centimeters. These rules would familiarize the people with the new system and aid in its adoption.

The Effect of Sunshine on Fire.

At the meeting of the Scientific Association at Buffalo, Prof. Horsford, of Cambridge, read a very interesting paper on the above subject.

He commenced by alluding to the popular notion that sunshine deadens fires; mentioning that the fires in grates in rooms having southern exposures burn briskly in the early part of the day, slacken before noon, and revive again before sunset. Stoves and ranges that bake well in the autumn, winter, and spring, fulfill their office but indifferently in the middle of the day in the hight of summer. Some furnaces, in which iron is generally smelted without difficulty, cannot in very hot terms be brought to a working heat. While the popular mind ascribes these effects to some agency of the sun, scientific men are disposed to regard the effects as rather apparent than real.

The first recorded research bearing upon the subject, was made as long ago as 1825, by Dr. Thomas McKeever, who found, as he conceived, the popular impression sustained. In his experiments a given weight of wax taper was consumed quicker in the dark than when exposed to the sun. A given length of candle required less time for combustion in the dark than in sunshine. A given weight burned quicker in a paintedlantern than in an uncoated lantern, both alike exposed to the sun.

These experiments did not find acceptance with Gmelin, and did not appear in the original Hand Book of Chemistry, doubtless from a conviction that some error must have occurred either in the method or record of observation. Nevertheless, Dr. McKeever's experiments apppear as additions in the Cavendish Society's translation of the Handbook. The summary of his results may be stated thus: It required eleven minutes to burn in the sunshine the same weight of candle that burned in the dark in ten minutes.

Similar experiments were made at a later period by Dr. Morrill Wyman, of Cambridge, and reported to the American Academy of Arts and Sciences. The result at which he arrived was exactly the reverse of that reached by Dr. McKeever. He burned two sperm candles, each alternately for half an hour in the sunshine and darkness, and found the candle during its exposure to sunshine burned more rapidly than when in the dark.

In 1856 the subject was taken up by Prof. Joseph Le Conte, of Columbia, S. C. He concentrated, with the aid of a reflector and burning glass, the sun's rays upon the flame only of a wax (sperm) candle in a large dark room. At the same time another candle was burning in the same room, under identical circumstances, except that the flame was not exposed to the sun's rays. The result showed that the effect of the sun's rays, though greatly exaggerated by concentration, when confined to the flame, did not appreciably increase the consumption of tallow.

Here, then, we have apparently all possible results of experiment, to wit. Sunshine diminishing the rate of combustion, as observed by Dr. McKeever; augmenting the rate, as observed by Dr. Wyman, and producing upon it no effect whatever, as shown by Prof. Le Conte.

Dr. McKeever ascribed the retardation to some peculiar effect, as of interference of the solar rays upon flame.

Dr. Wyman inferred that the sunshine, by warming the tallow of the candle exposed to it, facilitated its melting, and by so much spared for destructive distillation and combustion the heat of the flame, which would have otherwise, in larger measure, gone to liquefy the tallow.

Le Conte exclusively showed that when the column of wax or tallow is sheltered and the sunshine directed solely on the flame, the effect on the consumption of the tallow is too small to be recognized.

The observations of the later experimenters agree

in throwing doubt upon the interpretation which Dr. McKeever gives of his own experiments.

Prof. Horsford then proceeded to detail a series of experiments he had made, showing the probable source of error in Dr. McKeever's investigation. He ascribes it to the incidental greater flaring of the candle in the dark. The experiments with the lanterns he explained by the well known effect of dark paint in absorbing radiant heat and converting it into heat of conduction, by which the air in the painted glass lantern was more heated than in the lantern that was not painted.

Prof. Horsford then gave an account of the diminished draft in the range flue of his dwelling house during the recent hot term, which rendered it impossible to bake meats or bread in the oven of his range. This continued from eleven o'clock to about three, within which hours bread could not be baked. With the decline of the sun in the afternoon, as in the early morning, the oven performed its office better.

The chimney was 54 feet high. The roof of the house was of dark slate. It was all exposed to heat before eleven. Some of it began to pass into shade about three.

In the effect of this greater exposure to the sun, during the hours when the sun was highest, Prof. Horsford found the explanation of the observed phenomenon. The heated top and sides of the house warmed the air in contact, giving rise to an upmoving column from the top of the house, and to an endless shroud of air sweeping up the sides of the house. This ascending shroud by friction draws the air from the cracks, doors, and windows of the house, lessening the pressure of the air in the interior, and, of course, diminishing the draft.

After showing the applicability of this explanation to the various cases that occur with dwellings, iron furnaces, etc., the paper concluded with the following summary :—

First. That sunshine falling on the flame only of a burning body does not affect its rate of combustion.

Second. That, other things being equal, neither light nor darkness exerts appreciable influence on the rate of combustion.

Third. That, other things being equal, of two samples of the same combustible, one burning in sunshine will consume more rapidly than one burning in darkness.

Fourth. That combustion during the winter is more vigorous than in the summer, because a given volume of air contains more oxygen—is denser and drier.

Fifth. That slight currents, by causing a flame to flare and come in contact with more air in a given time, cause more rapid combustion, and by presenting greater surface from which radiant heat issues to warm the combustible about to be burned, increase the rate of combustion.

Sixth. That the diminished draft of chimneys in very hot weather, when the general atmosphere is at rest, and the sunshine intense, is due to upward currents on the outside of the house, arising from the heated surfaces of the roof and walls, which currents, by friction, draw outward, through cracks and open doors and windows, the air from the interior of the house, and so lessen the pressure within and overcome the draft of the chimney.

Seventh. That the popular impression that intense sunshine lessens the draft of chimneys is founded in fact.

A Life-Saving Machine.

A new life-saving apparatus was lately tested near Boston, under the direction of Captain Fengar and Commodore R. B. Forbes. Commodore Forbes placed his mortar at Deer Island in position, and at the signal it was discharged, the hollow shell flying high across amidships and leaving the line in the rigging. It was quickly secured, and in a few minutes the larger line was drawn in, made fast, and the communication with shore thus secured. The life car, in shape like the Winans steamer, and made of painted canvas, stretched on a light frame, was hauled along side, into which two sailors were snugly stowed, through the "manhole," and in three minutes safely landed ashore. The experiment was entirely successful.

Enlargement Test for Ordnance.

At the Manchester, England, meeting of the Institution of Mechanical Engineers, Mr. Whitworth read a paper on the expansion of guns in firing and his device for the measurement of the bore. We find the following report in the *Engineering*. We refer to the statements therein contained in another column :—

"Mr. Whitworth's (the president's) paper expressed the opinion that the "best" proportion of a solid projectile was three diameters in length, and that a gun would properly consume a powder charge one-seventh of the weight of the shot. Why these arbitrary proportions were best was not explained, yet Mr. Whitworth applied them to the 13.3-inch gun, which, he said, should throw a 990-lbs. shot, and consume 141 lbs. of powder, while the American 15-inch guns should throw a 1,522-lbs. shot, and consume 217 lbs. of powder. Because neither of these guns could bear anything like such charges, their bores were pronounced "too large," and the guns themselves were "inefficient." These conclusions, or rather broad assertions, were not, perhaps, strictly covered by the title of the paper, and they were undoubtedly open to dispute. It will, we think, be generally agreed that the efficiency of guns should be measured by the total destructive power which they can exert without injury to themselves ; and we very much doubt whether, of two guns of the same weight, and firing the same powder charge and weight of shot, that with a small bore and long projectile would withstand as many rounds as the larger bore worked at a lower initial pressure, and giving more room for the due expansion of the powder gases. But to proceed to the measuring instrument. It was designed by Mr. Whitworth, in 1864, to ascertain the enlargement of the bore of the 70-pounder gun during the competitive trials of the special committee at Shoeburyness, the primary object being to test the amount of charge which any particular gun would bear without injurious disturbance of its parts. The instrument is simple enough, and consists of two tubes, one within the other, and both rather longer than the bore of the gun. To the inner end of the outer tube is attached a brass head with three arms, having each a groove upon its face, within which grooves radial steel "feelers" are set out to the exact diameter of the gun, by means of a screw of fine pitch on the inner tube, and which draws in a cone which sets out the "feelers." An index pointer on the inner tube moves in a slot cut in the outer end of the outer tube, and by the position of this pointer the exact gage of the gun is read off. The tubular measuring rod is supported within the muzzle of the gun by a grooved brass pulley, so that it can be moved freely backward and forward in the bore. The instrument would indicate to within the one ten-thousandth of an inch at any part of the bore. The exact measure of the bore at the middle of the length of the powder charge and at the middle of the length of the projectile were ascertained before commencing to prove a gun, and also after each successive charge, commencing with a somewhat small charge. As was to be expected, a small enlargement was found to take place with ordinary service charges, and irrespective of the decided enlargement due to overcharges. In the case of the 70-pounder gun, the measurements, taken during the firing of nearly 3,000 rounds, showed that the bore enlarged regularly with successive charges of 10 lbs. of powder and a 70-lb. shot, and this enlargement was attributed to the wear of the chamber of the gun by the action of the powder. In the first 2,886 rounds the enlargement of the diameter was 0.0198 inch. In the next 50 rounds—20 of them having been fired with 140-lb. shot and 20 with 280-lb. shot—the further enlargement was 0.017 inch, showing that nearly as much enlargement was caused by these 50 rounds as by the previous 2,886 rounds. The last 15 rounds—fired with shot of from 350 lbs. to 490 lbs. and five of them with an increased powder charge of 15 lbs.—produced a further enlargement nearly equal to that of the 2,886 rounds. The instrument thus afforded the same means of carrying out the test of guns as are now adopted in the testing of girders, in which the effect due to the test loads is observed, and the permanent set noted. One curious result noted was, that Mr. Whitworth had fired charges with 12-inch air space between the powder and shot, and without bursting the gun. It was enlarged, however, exactly at the base of the shot, where the force of the explosive gases was suddenly arrested in an accumulating wave of pressure. The same gun was next fired with 1 inch more of air space, or with 13 inches between the powder and the shot ; and here again the gun was bulged exactly at the base of the shot, or rather at that point, 2 inches from the base, where the full diameter of the well-known Whitworth 70-lb. projectile is reached. And between the distinct bulge due to the 12-inch air space and that due to 13-inch, the intervening inch along the bore of the gun was found to be parallel. Mr. Whitworth has begun to vent his guns with platinum, and this has stood 4,000 rounds, whereas the copper vents required to be replaced after only 200 rounds.

Breech-loaders and Patched Rifle Balls.

From "F. R.," we have received a communication in regard to an article in our issue of Aug. 11th, from "An Unbeliever in Breech-loading Fire-arms," which objected to these arms for sporting purposes, because the ball could not be patched. Our present correspondent claims to have constructed a cartridge which carries a patched ball, designed for breech-loaders, which makes this kind of arm the most efficient in use. The patch envelopes the bullet the same as in the muzzle-loader, and the ball is secured to the cartridge by looped cords. In the discharge of the piece, when the ball leaves the gun, the patch drops off, leaving the projectile unincumbered. It has received the approbation of all who have tried it. The advantages claimed are :—

First. The greased patch causes an even, smooth fit between the barrel and the ball ; prevents the irregular, vibratory motion of the bullet, and causes it to leave the barrel without that erratic jerk, with which the rough, naked ball leaves the rifle.

Second. The greased patch acts as a swab, effectually cleaning the gun, after every fire, from the foulness of the previous discharge, allowing, positively, no dirt to collect in the barrel. This alone renders the improvement invaluable. The bare, naked ball never did this ; it only ground or rubbed the dirt into the polished inner surface of the barrel ; at times clogging in the barrel, and bursting the piece, and at times, jumping and tearing across the twist, destroying the rifle. If any one will examine an ordinary breech-loader, which has been frequently used, he will find the interior of the barrel sprinkled with a nebulæ of rust. This oxidation is the result of the grinding into the barrel the acid foulness of the burnt gunpowder, and can be removed only by mechanical means. Compare with this the muzzle-loading, patched-ball rifle—smoother, brighter, better years after, than the day on which it was made, all because it uses the patched bullet.

Third. A rifle using the patched ball will not only shoot better, but will last a lifetime ; it will scarcely wear out, and is never leaded.

Fourth. With the greased patch, there is not so much force lost in overcoming the friction, and the force before so spent now assists in giving the ball a higher initial velocity.

Sawing Lumber.

A correspondent, D. L., of Vermont, who claims to have had many years experience in setting up and running circular saw mills, says that the "end play" delusion is still cherished by many in the Middle States, but in New England it is rejected. He says he is running a saw 50 inches in diameter, at 800 revolutions per minute, sawing spruce and hemlock, some of it very knotty, on one-and-a-half-inch feed ; and most of the lumber is sawed so smoothly that it is difficult to tell, by the appearance of the boards, how much the saw cut at each revolution. He thinks it would be impossible to run a 50-inch saw 800 revolutions where "end play" is permitted. If the power is limited, the speed should be reduced. It is better, he says, to run 400 revolutions per minute on one-and-a-half-inch feed than 800 at ¾-inch feed. It dulls a saw as much to saw 500 feet of lumber on ¾-inch feed, as to saw 1,000 feet on one and a-half-inch feed, and requires almost as much power, if the saw is in proper order.

MEERSCHAUM AND AMBER.

Less than twenty years ago meerschaum was practically unknown in this country. The specimens that existed were in the hands of scientific men, or in the cabinets of travelers, who had gathered knick-knacks from every place they visited. Subsequently a sudden furor for meerschaum pipes seized upon the people, and now there is hardly a smoker who does not possess a cherished meerschaum, the changing complexion of which is an object of greater solicitude to him than the infant's first teeth to a mother.

Meerschaum—German for sea-foam—is a hydrous silicate of magnesia, the composition represented by the formula

$$Mg\ O,\ Si\ O_3 + 2\ H\ O.$$

It is of soft, porous texture, very light, but of varying specific gravity, and has a greasy feel. It is found in various parts of Southern Europe, in veins of serpentine and in tertiary deposits. It occurs also in Asia Minor. It is easily cut, and when first removed from the bed is of a cheese-like consistency. Frequently the meerschaum is too porous for manufacture into pipes, the principal use to which it is applied. It is capable of receiving a fine polish, and can be easily carved. The ornamentation of meerschaum pipes is, in Europe, a distinct branch of business, or rather a distinct department of art; for there is no substance, nor article of use and ornament, which receives more artistic finish than the meerschaum pipe. There is one now in this city, which, for its graceful form and elaborate carving, is valued at five hundred dollars.

The finished pipes are soaked, or boiled, in milk or wax, the fatty substances of which are absorbed by the meerschaum, and are acted upon by the nicotine of the tobacco, in combination with the heat of smoking, to produce the rich yellow and brown colors so much admired. Those which have been treated in milk have a rich, creamy white, while those which have absorbed wax are a delicate shade of straw.

The manufacture of the meerschaum for a cheaper quality of pipes is largely prosecuted. These artificial preparations are from the chips, or parings, of the natural mineral, which are reduced to fine powder, boiled in water, molded and dried. Sometimes, pipe clay is added to the mixture. It is said there is no certain test for distinguishing the artificial preparation from the genuine meerschaum. The first is generally heavier and of a more even texture, owing to the absence of foreign minerals frequently found in the latter. The manufactured meerschaum does not receive color so well as the natural block, and is liable to chip and scale.

Amber, so extensively employed as mouth-pieces for meerschaum pipes and cigar holders, is believed to be a fossilized vegetable gum or resin. Anciently a fabulous origin was attributed to it. As it was found on the sea shore after a storm, it was said to be the solidified tears of the sisters of Phaëton, or of sea nymphs. It is of a yellowish color, frequently streaked with milky white, the yellow color being semi-transparent. Those specimens which have a clouded-milky appearance are the most highly valued, as the clear yellow can be imitated by recent and cheaper gums. It is singularly electrical, when rubbed, developing negative electricity to such a degree that in manufacturing it into the forms in which it is sold, the workmen are sometimes affected with nervous tremors, and they are obliged frequently to change the pieces they handle.

It is found on the Baltic coast of Prussia, either washed ashore after a gale, or entangled in masses of seaweed. Mines of it are also wrought in Prussia. It is found in this country at Amboy, N. J.; at Gay Head, Martha's Vineyard; and at Cape Sable, in Maryland. Leaves of fossil plants and tropical insects are sometimes found imbedded in it, a fact that has given rise to some pretty poetical conceits. In the East it is highly valued, and has been used as a form of concentrated wealth, as are diamonds and other precious stones. When heated, it exhales an agreeable odor, and for this, among other reasons, is in great request as mouth pieces for pipes.

TURKEY is about to convert its rifles into breech-loaders, and a thousand rifles have been ordered in England as experimental pieces.

The Corn Crop.

The crop of Indian corn in the United States in 1860, according to the census returns, was 838,732,740 bushels. Vast as was this yield, it bids fair to be largely exceeded the current year. From the increased breadth of the land under cultivation, and the generally favorable season, it is estimated that the crops of 1866 will reach 1,000,000,000 bushels, worth, at 60 cents per bushel, $600,000,000. This is truly a great wealth, and it is difficult to place a limit to the production of this cereal in our broad domain. It grows in abundance from Maine to Texas, though flourishing with greatest luxuriance in the Western States, side by side with wheat, where it waves its tassels and grows golden over prairies and broad fields, reminding one forcibly of incipient forests. Broad as are our acres, and extended our agricultural territory, there are few sections where corn cannot be profitably grown, while in most parts its production is enormous. The Commissioner of Agriculture reports the corn crop of the single state of Illinois in 1865, as 177,076,867 bushels, or nearly one-third of the entire crop of the country in 1850, which was 592,071,104 bushels. The cultivation of the corn crop, too, is attended with much less difficulty than it was fifteen or twenty years ago. The skill of invention and the hand of mechanical art have contributed largely to this result. There is not now that absolute need for careful manual husbandry which was deemed essential in former years. In the leading producing States, land well plowed, planted by machine, with a man and team, at the rate of many acres per day, and worked twice with an improved cultivator, is all that is now required, beside a good season, to insure a teeming harvest. In consideration of its utility, the corn crop is scarcely second to that of any other American staple. It is valuable for food, and is not only thus largely employed at home, but is annually used more and more in Great Britain and Ireland and elsewhere abroad. It makes the best of feed for stock; it is used to an enormous extent for the distillation of spirits, and it is claimed that a process has been discovered whereby it can be converted into sugar. In addition to the uses to which the grain can be turned, the stalks make excellent winter fodder, and return to the soil as much in the shape of fertilizing material, perhaps, as they take from it.

Thus year after year, the area of this great wealth enlarges, and it is difficult to say what untold millions are yet destined to be fed with this cereal from the lap of American agriculture. Let him who dreams of a "ruined country" look to its wonderful resources, and believe, if he can, that a land so infinitely endowed in natural wealth, and a people with such indomitable enterprise, can fail to make rapid strides in everything which pertains to material progress.—*Shipping and Commercial List.*

Hardening Long Planing Knives.

In No. 10, current volume, we replied to a question by W. J. C. of Louisiana, in regard to hardening and tempering long planing knives. Ede gives another process which may be better, but having never tried it we cannot fully indorse it. He says:

Lead is an excellent thing in which to heat any long plate of steel that requires hardening only on one edge; for it need not be heated any further than where it is wanted hard, and it will then keep straight in hardening. But if it is heated all over in a furnace and put in the water all over, it will be warped all shapes and cause a deal of trouble in setting straight, especially to those who are unacquainted with the setting of hardened steel. If it is heated all over, and one edge only dipped in the water, the edge that goes in the water will be rounding, and the edge that does not go in the water will be hollow; this is owing to the steel expanding in hardening, for the steel expanding in hardening causes the edge that goes into the water to get longer, and the other edge being kept out of the water, and still hot, the hardened edge expanding longer pushes the other part of the steel round, causing the edge that is out of water to be hollow. But if it is heated in red hot lead, and the edge only that is required hard put in the lead, the other part will be quite cold; and when it is put in the water all over, the hot part will not have sufficient strength in it to alter the cold part, consequently the cold part keeps the hardened part true.

MISCELLANEOUS SUMMARY.

THE delicacy of some of the ornamental cast-iron work, known as Berlin iron, is such that it requires of some pieces ten thousand to weigh one pound.

THE engines of the large ocean steamers make about 200,000 turns in crossing the Atlantic between Liverpool and New York.

IN 1814 the Barrowdale black-lead mine was assessed as worth £2,000 a year. It had been valued at 15s. 4d. two hundred years previously.

WITH four weights of respectively one pound, three pounds, nine pounds, and twenty-seven pounds, any number of pounds from one to forty may be weighed.

THE brilliant prismatic colors of the pearl are attributed to the decomposition and reflection of the light by the numerous minute grooves on its surface.

SWEDEN and Norway are slowly rising out of the sea at the rate of from one-tenth to one-half of an inch per annum. The west coast of Greenland is gradually sinking.

A SUCCESSFUL effort, it is said, has been made to raise vanilla in France. The experiment was made in the public gardens of the St. Bruno, and the quality is affirmed to be equal to the best imported from the West Indies.

OF the durability of timber in a wet state, the piles of the bridge built by the Emperor Trajan over the Danube afford a striking example. One of these piles was taken up and found to be petrified to the depth of three-quarters of an inch, but the rest of the wood was perfect.

TREATMENT OF ITCH.—The Prussian military authorities cure itch by smearing the parts with a mixture of two parts of liquid storax with one part of sweet oil. The cure is said to be complete in twenty-four hours.

BLAST furnaces are about to be erected in Oregon by the Oregon Iron Company. The works are to be located on the Willamet River, eight miles above Portland. Iron, timber, and water-power are plenty there. They will be the first blast furnaces in operation on the Pacific coast.

ONE of the largest bells in the United States has been cast for the city of Pittsburgh, Pa. The amount of metal contained in the rough casting is 7,200 pounds. It measures sixty-six inches across the mouth, and sixty-two inches in hight to the top of the crown.

DR. COQUEREL, a French naval surgeon, has published a curious article on the fatal results experienced, both in Mexico and in Guiana, from a species of fly, which deposits its eggs inside the human nostrils. Several soldiers have died of the consequences.

A LARGE CHEESE.—The Ingersoll cheese factory, in Canada, has manufactured a cheese which measures six feet eight inches in breadth, and three feet in thickness, and weighs three and a half tuns. It required thirty-five tuns of milk, the product of eight hundred cows.

VARNISHES.—Messrs. Wilson & Wood, of Philadelphia, Pa., have sent us some samples of photographic varnishes by Wenderoth, of that city. One sample is for covering and protecting photographs, drawings, and water-color pictures. Another sample is a mixed varnish for water colors, which greatly facilitates their use upon photographs, tracings, and surfaces which refuse to take colors readily.

AN employé of the Bavarian Mint has patented an improved process for silvering by means of a solution of silver in cyanide of potassium; the difference from the usual method consists in the use of zinc-filings, with which the objects are coated; when the silvering solution is applied, an immediate deposition of a much more durable character taking place. The filings are easily removed by rinsing in water, and may be used repeatedly for the same purpose. Metallic iron may be coated with copper in the same manner, by substituting for the silver a solution of copper in cyanide; and over this copper deposit, a coating of silver may be applied.

Improved Planing Machine.

Those who have used planing machines, or those for tonguing and grooving, know that the proper adjustment of the cutter head for varying thicknesses of stuff is frequently annoying, consuming time and increasing vexation. The engraving illustrates a device for obviating these difficulties, which appears to be thoroughly practical and efficient. The inventor is a practical man, who has been very successful in all his many inventions.

A is a frame, supporting, by means of the boxes, B, the driving shaft, C, with driving drum, D, and cutter head, E. It is secured to the frame of the planer, or machine, below the floor, or bed of the machine, by means of a set screw passing through the nut, F, and the whole attachment can be adjusted laterally for different widths by the set screw and the foot, G, which slides on a guide. The frame, A, is attached to the support, H, by means of dovetail groves at H and I, through which it slides up or down, on turning the screw, J, by the crank, K. The screw turns in a collar, L, and through the nut, M, raising or depressing the frame, the distance being graduated by the pointer and scale, N.

By means of these attachments the vertical and lateral set of the cutters is easily and quickly regulated for the differing thicknesses of lumber, whether the planer is in motion or not. The cutter head, E, can be run down below the surface of the planing bed when the machine is to be used for surface planing.

Patented through the Scientific American Agency May, 8, 1866, by Joseph Dixon, cor. 38th-st. and 1st ave., New York City, to whom all letters for orders or information should be addressed.

Fig. 1

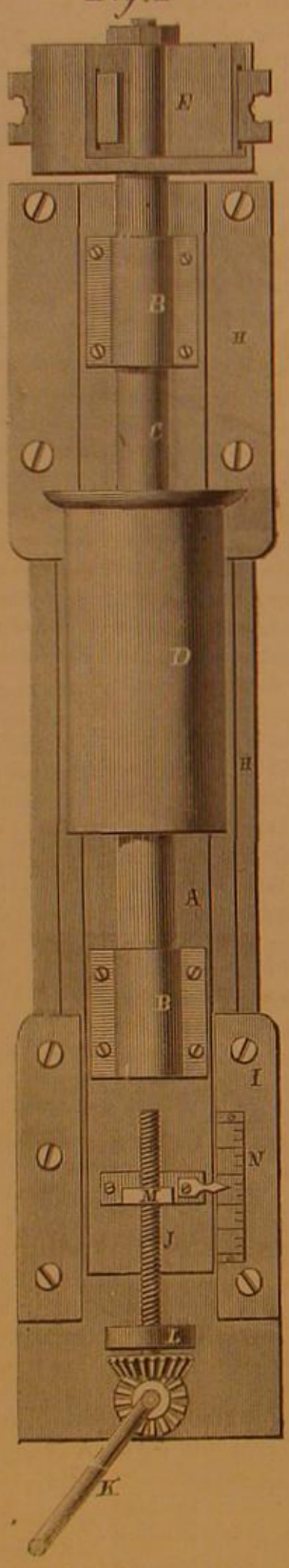
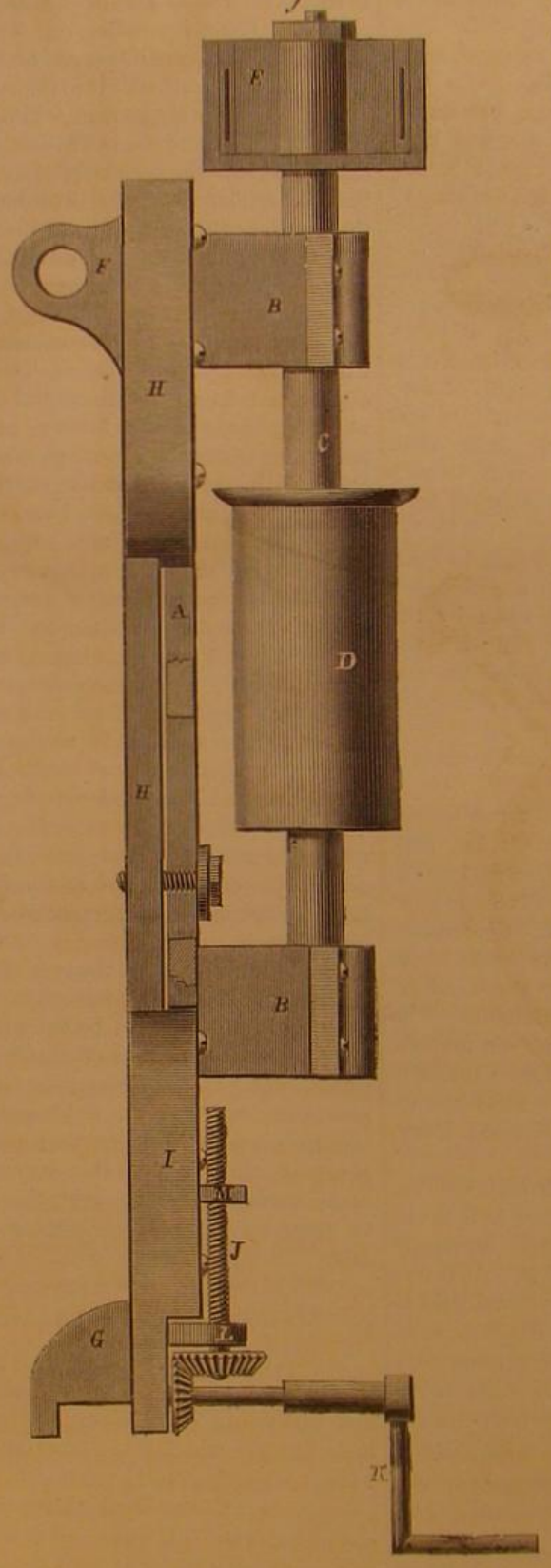


Fig. 2.



DIXON'S PLANING MACHINE.

The Power of Infection.

In our last number we published an extract from the report of William Crookes, which specified the nature of the infecting matter in the cattle disease. We make further interesting extracts:—

"There are weighty reasons for deciding that the infecting matter is neither a gas nor even a volatile liquid. The almost infinite attenuation which a gas undergoes, owing to its rapid diffusion into the atmosphere, would render its supposed noxious influence imperceptible a few yards from the focus of infection. Moreover, the infection is capable of being carried considerable distances in clothing or running water, and in a variety of ways incompatible with the behavior of gases. For these reasons, and many others unnecessary to adduce here, it seems clear that the disease must be communicated by the agency of solid, non-volatile particles.

"The specific disease-producing particles must, moreover, be organized, and possess vitality; they must partake of the nature of virus rather than of poison. (The words virus and poison are generally regarded as synonymous. It would be more convenient, and would tend to promote accuracy of thought, were the distinction here made generally adopted.) No poison yet known to chemists can approach, even in a faint degree, the tremendous energy of the active agent of infectious diseases. A poison may be organic, but it is not organized. It may kill with far greater rapidity than the virus of infection, but, unlike this virus, it cannot multiply itself in the animal economy to such an extent as to endow within a few hours every portion of its juices with the power of producing similar results. A virus, on the contrary, renders the liquids of an infected animal as virulent as the original germ. Strychnine may be regarded as the type of a poison, and vaccine matter as the type of a virus.

"Many considerations tend to show that the virus of cattle plague is a body similar to vaccine lymph, and consists of germinal matter, or living cells, possessing physiological individuality, which, if not exposed to extremes of heat, cold, or dryness, are capable of preserving their activity for a certain time outside the living organism, of adhering to material objects, and of being carried from one place to another by currents of air; each, when introduced into the blood, requires a certain time (known as the period of incubation) during which the septic germs develop and multiply, until they have so far poisoned the blood that the ordinary symptoms of disease become manifest.

"The blood poisoning thus set up may legitimately be called 'fermentation;' it is a decomposition caused by the act of nutrition of the living cell, whereby it reproduces in incalculable numbers the specific septic germs which have given it birth. These gradually infest the blood and other animal liquids, and, as the disease progresses, are discharged from the skin, throat, glands, etc., the breath, perspiration, and excreta of the animals forming vehicles for the distribution of the virus. By 'living' cells, is not meant living, in the sense in which an animal, or even a low form of infusoria, lives; but living as a seed, or as vaccine matter, even when dried, may be living, inasmuch as it still possesses reproductive vitality.

"It is by no means certain that the multiplication of these individual cells is the immediate cause of the blood poisoning. The analogy of the action of virus on the blood, to that of yeast on sugar, renders it more probable that this is not the fact. In the case of the best-known ferment—yeast—its cells multiply by feeding upon the sugar in the liquid; alcohol and carbonic acid being their excretions. It is, therefore, probable that during the multiplication of the virus cells, they, in a similar manner, impoverish and weaken the blood, by feeding upon some element in it, while at the same time they excrete a poison to which the symptoms of the disease may be immediately due."

The Atlantic Cable.

The great question that remains for time to solve is the probable duration of the cable. No similar wire has ever lasted more than a few years, but many of the conditions of an Atlantic cable are more favorable to longevity than those of any rope previously submerged. In the first place the manufacture has been more perfect, and the tranquillity of the deep ocean gives an additional expectation of life to the cable. Still, no very prolonged existence in working order can be predicted until it shall be found practicable to lay a much heavier wire than that which now traverses the Atlantic. All past experience shows that a very thick cable may be trusted to last for an indefinite time, while those of less bulk are always in danger of fracture from the gradual rusting of the iron casing at points where a considerable strain may exist. A thoroughly satisfactory Atlantic cable will never be submerged until we have two *Great Easterns* to divide the work between them; but if the new line lasts in good condition even as long as the fractured wire of last year, enough will have been done to insure the ultimate establishment of permanent telegraphic communication across the Atlantic. It may be hoped that the comparatively slight cable which has just been laid will have, at any rate, years enough of life in it to insure to the enterprising promoters of the scheme the pecuniary reward which they have so well deserved.—*Saturday Review.*

Filling for Millstones.

We condense a communication on this subject from Wm. Kevill, of Sterling, N. Y. He uses for the purpose pounded burr block, alum, and gum arabic:—"First dissolve the gum arabic in hot water, as thick as you can obtain it; then melt the alum, and after it is melted, stir in the gum arabic. Next stir in the burr block till about as thick as you can work it; then fill the seams and holes with it while it is hot.

"When cold, it will be quite hard and tough. The gum arabic toughens the alum, and the burr block saves it from wearing away. If there are any large spaces to fill, I would fit in as large a piece of the burr as I could, then cement it in with the above mixture, and face it even with the stone. Alum alone soon melts with the heat of grinding, and wears away; pounded brick adds a little to its durability; dry sand is a little better, but the burr maintains the best face of anything I ever used, or saw used. Lead is not used in this part of the country for such purposes. I should hardly suppose that a miller would think of using such a substance."

HAGENMEYER'S IMPROVED OIL CUP.

The valves and pistons of steam engines, although partially lubricated by the steam, sometimes require oil, and it is not easy to get the oil in against the pressure of the steam by one operation. There are a number of devices in use to obviate this difficulty. That shown in the engravings appears to be as effective and simple as any, and is some respects is decidedly superior. The steam can in no case force the oil out over the person of the operator, and the lubricating material, whether oil or tallow, must find its way to the steam chest and cylinder.

The receiver, A, by means of a shank, screws into the globe, B, which is secured by the shank, C, to to the steam chest. The stem, D, is a valve at its lower end, which is seated into the shank at E. The lower stem, F, is also provided with a valve, G, seated in the shank of the globe, B. These parts are common to both figures in the engraving, but Fig. 1 shows one method of operating the valves, and Fig. 2 another. The lower stem in Fig. 1 has a screw thread on its upper end, which works in the shank,

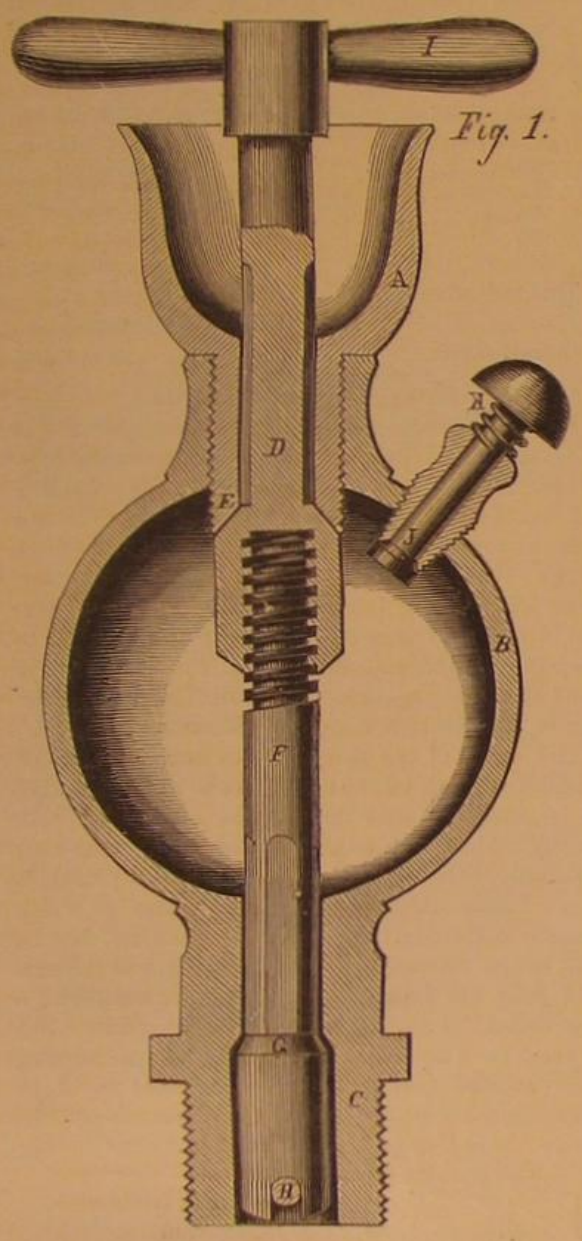


Fig. 1.

D. This lower stem is prevented from turning by a pin, H, passing through the recess, and seated in the shank, C. The recess permits a slight upward and downward movement of the valve, G, while it prevents its turning. By screwing the upper stem, D, on the lower stem, which is done by a half turn of the handle, I, the valve, E, is unseated, allowing the oil or melted tallow in the cup, A, to descend into the globe. But the same movement which opened E, by the depression of the valve, closed G by its elevation. By reversing the motion of the handle, I, the upper valve is returned to its seat,and the lower one opened, permitting a communication between the globe and the steam chest, or other part to be lubricated. A pet valve, J, permits the escape of the atmospheric air, or steam, that may be in the globe. It is worked by pressing on the button with the thumb. The spiral spring, K, returns it to place.

Fig. 2 is a simpler form of the oiler. The two valves are connected by means of a pin, H, passing through the stem, D, and through a slot in the stem, F, which allows either of the valves to rise and fall a little way, independent of *the other*. The lower end of the shank of A, and that of B, is formed into an incline or spiral plane, against which the pins, I, in each of the valves, work. These inclines run in opposite directions, so that when the handle, J, is turned, E will be forced open, and G allowed to close. The operation can now be readily understood. It is precisely like that of Fig. 1. The valve rod,

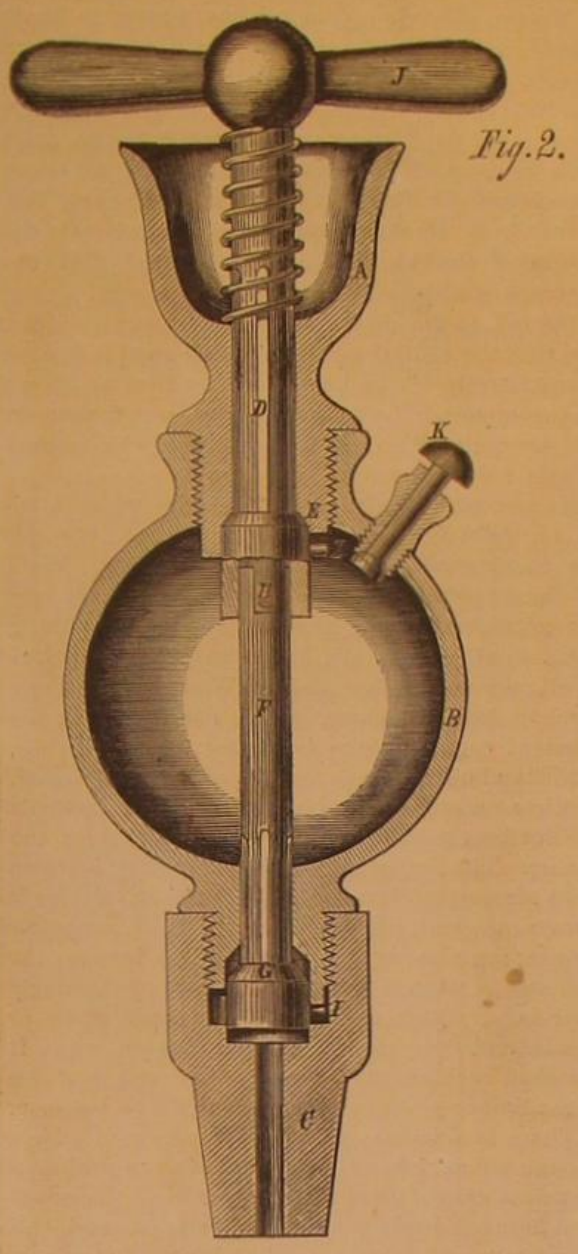


Fig. 2.

D, in Fig. 2, is furnished with a spiral spring which keeps the valve closed except when rotated. The pet valve, K, is operated by turning, having a pin and incline similar to those on the valves, F and G.

Patented Aug. 8, 1865, by Gebhard Hagenmeyer, of Big River, Cal.

The Lindner and Remington Rifles.

The new systems which may soon have a practical trial on the battle field are those of Lindner and Remington, a description of which will, doubtless, be acceptable, considering the excitement breech-loaders are now causing. Lindner's *principle*, in its application to the Australian rifles, may be briefly described as consisting of a breech plug having a screw cut on its exterior to fit a corresponding female screw in the barrel. Longitudinal grooves are cut through the threads from end to end of the screwed part, both of plug and barrel, thus enabling the former to be thrust into its place, the parts of its threads left standing passing down through the grooves cut in the barrel, and *vice versa*. Arrived at its place, one-sixth of a turn to the right given to the plug by a small lever outside causes the screws to bite, and tightens the whole arrangement. No alteration is required in the lock, and the percussion cap is still retained, but is used in a modified manner, being pressed into a hole prepared for it on the back of the cartridge. The pouch is thus done away with, and the soldier has only to seek for his ammunition and press its end containing the cap on the nipple, which is roughened to retain the cap, before putting the cartridge into the rifle. It will thus be seen that the Lindner system of ammunition lies between the ordinary capping arrangement and the principle of carrying its own ignition. The Remington rifle is a recent introduction from America, and possesses the merits of being very simple in construction and having but few parts. The barrel is bored completely through, and has its rear end closed, when ready for firing, by a pivoted breech piece. This breech piece, the hammer, and the trigger are the only three movable parts, and *in* this the simplicity of the arrangement lies. Provision is made for locking the hammer while the arm is being loaded, so that the trigger cannot be moved until the end of the bore is properly closed by the breech piece. On firing the gun the hammer falls upon a projection on the side of the breech piece, and supports the latter during the time of discharge. We hear that this gun has recently made some good practice, having been fired 20 times in 69 seconds; this, from its simplicity, it ought to do, and for rapidity no doubt it would stand well. But we have our misgivings as to the escape of gas, and more than all as to the power of the hammer to retain the breech piece against the rear end of the barrel during discharge. In fact, we have been informed that an accident has already occurred by the discharge forcing the block and hammer back. In construction, too, the gun appears exceedingly weak at the junction of the breech with the stock, the wood being cut away to a considerable extent.—*Mechanics' Magazine.*

The Peat Manufacture.

This subject is arousing a deal of attention all over the country. Last week several gentlemen were in this city purchasing engines to drive machinery for manufacturing peat at the Great Dismal Swamp, Virginia. They represent a company formed in Massachusetts for this purpose. One of them stated that the deposits of peat in the Dismal Swamp are practically inexhaustible. They will commence operations with six engines.

Undoubtedly there is much value in peat as a fuel, but it is possible that its importance as a substitute for coal is over-estimated. Where peat is found, and coal does not exist, it is doubtless true that the former is the cheaper fuel; but when it is to be brought from its place of production or manufacture, it may be problematical whether it could be afforded as cheaply as coal transported the same distance. The price of coal at the mines is almost nominal. Its cost to the consumer at a distance is the cost of transportation, mainly. Certainly, the cost of transporting a tun of peat must be greater than that of coal, because of its greater bulk, and it is certain that the first production and subsequent manufacture of peat cannot be much less costly than the mining and screening of coal. We think it will be found that the manufacture of peat will not greatly affect the price of coal, except in localities where there are easily-accessible deposits of this combustible turf.

A. H., of Pennsylvania, sends us a copy of a photographic group of six young men, each having upon his head a stove-pipe hat. The position of the group is such that, in some instances, the face of one of the individuals is directly behind, and covered by, a hat in front. One of the faces of the party is seen through the hat in front, which conveys the idea of a transparent hat. On the back of the picture is printed the following affidavit, purporting to be sworn to by the six :—

The undersigned being duly sworn, depose and say, that the photograph on the reverse was taken without any attempt at fraud or deception; the transparent hat being a common cassimere hat, and no opera or glass hat, and was not moved durin the process.

Our correspondent says :—"I am anxious to know how it is possible that, under the existing circumstances, the photograph can show the face of one gentleman through the hat of another. If there had been anything of the mirror nature in the room, it might not be so hard to explain."

The "transparent" hat evidently had a movable crown, which was put on after the face behind had been partly photographed. It would be difficult to explain how a mirror could have been used.

LATIN.—If any body wants to commence the study of this interesting and time-honored language, we advise them to take up Harkness's Introductory Latin Book. It is a small work, but is wonderfully comprehensive and thorough. Published by Appleton & Co., New York City.

Correspondence

The French Exposition.

MESSRS. EDITORS:—I take pleasure in informing you that the immense structure in the Champ de Mars, designed for the Exposition next year, is progressing satisfactorily, and no fears need be entertained by our fellow countrymen in regard to the will or the ability of this Government to have it in complete order at the time specified.

It will cover forty-eight acres of ground, and is about half finished, but already shows, in its rough state, many marks of the bold designs of its architects.

Seventy-five acres of land immediately surrounding it are to be made into parks, and a liberal portion of the same will be known as the "park of the United States of America." This land, although unpromising in its appearance at present, will be rapidly transformed into graveled walks, beautiful flower beds, and picturesque fountains.

The astonishment and admiration of the nations of Europe, which we have won for ourselves by our military achievements, will here be increased by a proper display of the products of our genius and industry, showing that the arts of peace have not languished during the triumphant progress of the arts of war. You will readily see that it will be quite desirable for Americans exhibiting articles designed for sale, to secure the services of some one here acquainted with the different European languages, that our commerce may not fail to derive the immense benefits which are likely to follow from our products being properly presented and explained to the numerous peoples who will here be gathered from every portion of the globe.

JAMES W. TUCKER.

Paris, Aug. 10, 1866.

Insulation of Lightning Rods.

MESSRS. EDITORS:—It is a common error to suppose that lightning rods should be insulated, and a very natural one, arising from a superficial view of the subject. It should be remembered that currents of electricity in a rarified state are continually circulating through masses of matter, silently and without producing any manifest effects; the effect of insulation is to interrupt the flow of these currents, whereas the lightning rod ought rather to be so contrived as to facilitate their free passage from the building to the rod, and thence to the atmosphere, and *vice versa*.

During that disturbed electrical condition of the atmosphere which we call a thunder storm, these currents circulate in greater volume and rapidity, and a sufficient interruption of them brings about a discharge of lightning. At such times the insulation of the rod from the building is a most excellent device for causing an explosion of accumulated electricity either from or into the building, as the case may be. The rod, on the contrary, ought to act somewhat as a safety valve as regards any electrical disturbance within the house, neutralizing it gradually, and thus preventing an explosion. Should the rod be struck by lightning, its efficiency in carrying off the shock will depend on whether it presents a continuous chain of conducting matter in the line or direction of the discharge, which is superior to anything within the building. If it does not, all the glass in the world will not prevent fluid from leaving the rod and passing through the building on such conductors as it may find there.

The true theory or purpose of the lightning rod is to facilitate electricity in following out its natural laws and tendencies, and nothing can be more truly unscientific or practically absurd than the idea of presenting a barrier of obstruction to lightning.

A lightning rod of proper construction, therefore, is a sort of safety valve as regards electricity. To insulate the rod, is to tie down the valve. It should never be insulated. It may be fastened to the building with brackets of wood, or staples. In the application of the rod to the building, the conducting power of the building should be brought into the general line of conduction; that is, the rod should come in good metallic contact with all the important merallic substances upon the outside of the building, such as gutters, spouts, etc. Dr. Franklin, and Prof. Olmsted, of Yale College, bear testimony in favor of non-insulation, and the same view is taken in the "Cyclopedia of Useful Arts," and Appleton's "Dictionary of Mechanics." S. D. CUSHMAN.

New Lisbon, O.

Wood on the Prairies.

MESSRS. EDITORS:—The *sages* appear to be in a strife to see who can invent the most ridiculous theory to account for the Western prairies being destitute of timber; they frequently get up a new theory, but get further and further from the truth each time. At the fifteenth meeting of the American Association for the Advancement of Science, Professor J. S. Newberry presented a paper "On the Origin of Prairies." The Professor said, that the presence or absence of forests, as a general thing, depended on the amount of precipitated moisture, and that the central portions of this continent were comparatively dry, and consequently treeless, except on the mountain belts, which acted as a condenser, and precipitated an amount of water which would sustain a forest growth.

He also said, that the many theories which attribute prairies to other causes than the want of water are wholly erroneous, or only of local value. Well, his theory only proves that "New Berries" are very apt to be green. The cause of prairies is nothing but a local cause. We know that timber grows on all poor soil, either East or West, without any precipitating condenser, as he describes. In the Western country, there is timber on all islands, without a failure, not on account of any precipitated, or other moisture, but because the water prevents the fire from getting on the island to burn up the timber. The timber is also allowed to grow between forks of streams from the same cause, and timber is always present there. All side hills bordering streams are also covered with timber, because the rich soil is washed away, and it is comparatively poor land, which cannot produce much grass or weeds, and consequently the fire dies out when it comes to such ground for want of fuel, and thus also is the timber protected on the rich valleys between.

There is another grade of better land, which, though not as rich soil as the prairie, can produce a sufficient crop of grass for fuel to kill all timber except burr oak every time a fire is started, and this is the cause of what are called burr-oak openings. Burr oak has a thick, rough outside bark, which protects the inner or living bark, and enables it to live through a fire that actually kills all other timber. Then, in any direction from the burr-oak land, whether up the side of a mountain or on a plain, just as soon as the land grows poor and fails to produce the necessary amount of fuel hinted at, just then and there other kinds of timber commence to mix in.

Every acre of land in the Western States that is as poor soil as the land in the Eastern States is covered with timber, and that without a failure.

Land in the Eastern States, if manured and beat up to the producing capacity of the Western prairies, would then produce a heavy crop of grass, and such grass, if dry and set on fire, would kill all timber, and if the same thing were repeated each year, of course there never would be any timber on such land.

The rich prairies grow sufficient fuel to kill all kinds of timber when the fire is started, and that is all there is about it. PERRY DICKSON.

Jersey City, Aug. 25, 1866.

Timber on the Prairies.

MESSRS. EDITORS:—It is an erroneous idea that the Western prairies will soon be covered with timber where the annual fires are kept back. There are large tracts of land in this country, known as "barrens," of the same character as the oak openings of Wisconsin and Michigan, covered thickly with stools, which are not seen in summer on account of the grass. If fire is kept from these barrens, immediately every stool sends forth shoots, and what appears to a stranger as prairie, with here and there a tree or shrub, is soon covered with the thickest kind of a growth of timber. The genuine prairies are as entirely destitute of trees, stools, or shrubs as they were twenty years ago. Where timber and prairie adjoin, there has been no encroachment by the latter upon the former. Thousands of acres of barrens, during the same length of time, have become fine groves of timber. Cottonwood makes its appearance in cultivated fields, growing from the seed, which the wind scatters over the whole country. These are the only trees seen upon the prairie not planted by the hand of man. E. H. ROOD.

Bloomington, Ill., Aug. 6, 1866.

Cement for Millstones.

MESSRS. EDITORS:—The question of a cement for millstones has not, as yet, met with a satisfactory response. It seems to be one on which the millers are very taciturn. Although not a miller, my profession demands an intimate knowledge of the best cements, and I send you one used exclusively by millers of my acquaintance. Take of alum 1 lb.; yellow ocher, sufficient; melt the alum in its water of crystallization, and stir in the yellow ocher, in fine powder, until of the right consistency (about as thick as batter, or so thick that it will just flow), and pour while hot into the cavities.

There can be no poison here, for the composition of yellow ocher, which I give below, shows that it is a silicate of iron and alumina, with a trace of magnesia.

YELLOW OCHER.

Sesquioxide of iron	37·76
Alumina	14·21
Silica	33·23
Magnesia	1·38
Water	13·24
	99·82

This will give a hard and satisfactory cement.

SAMUEL P. DUFFIELD.

Detroit, Mich.

Saws--Lateral Motion.

MESSRS. EDITORS:—Having read a large number of opinions and experiences on keeping circular saws in order, I wish to say a few words on the subject.

I consider lateral motion unnecessary. The saw must be round, and the teeth must have set enough to run free in whatever timber you have to saw. Bend the teeth, if you choose, or upset altogether; but if you bend the teeth, you must upset enough to keep the corners, or points, full. I prefer both to bend and upset, because it will not wear down the size of the saw so fast as to upset alone.

The speed of the saw is to be governed by the number of teeth in the saw, and the kind of timber to be sawed. I find that a slow motion for soft, woolly timber, such as cottonwood, linden and elm, especially where knots and crotches are plenty, is best. I am running with less speed than Mr. Pettigrew recommends. My reason for running slow is, that in the knots of soft timber the rim of the saw will heat, but much less with a slow than with a fast motion. I feed 1¼ inches to the revolution with 18 teeth in a 50-inch saw, running 300 per minute, and cut from four to five thousand feet in eight hours, actual cutting, in elm and cottonwood. In pine, or other clean timber, I should double my speed, and perhaps use less teeth.

S. L. LOVELAND.

Marshalltown, Iowa, Aug. 13, 1866.

How to Banish Fleas.

MESSRS. EDITORS:—On page 82, current volume of the SCIENTIFIC AMERICAN, under head of fleas, you request information on the efficacy of pennyroyal to destroy these pests. Having had some experience on this subject, I give it to you for the benefit of your readers.

Much the largest number of these insects are brought into our family circles by pet dogs and cats, and the pig sty is generally filled with them at this season of the year, where numbers will hop on to you when visiting it for the purpose of feeding or inspection.

The oil of pennyroyal will drive these insects off; but a cheaper method, where the herb flourishes, is to throw your dogs and cats into a decoction of it once a week. Mow the herb and scatter it in the beds of the pigs once a month. I have seen this done for many years in succession. Where the herb cannot be got, the oil may be procured. In this case, saturate strings with it and tie them around the necks of dogs and cats, pour a little on the back and about the ears of hogs, which you can do while they are feeding without touching them. By re-

peating these applications every twelve or fifteen days, the fleas will flee from your quadrupeds, to their relief and improvement, and your relief and comfort in the house.

Strings saturated with the oil of pennyroyal and tied around the neck and tail of horses will drive off lice; the strings should be saturated once a day.

O. T. GIBBS.

Augusta, Ga., Aug. 14, 1866.

Simple Code of Signals.

MESSRS. EDITORS:—Having noticed in your issue of Sept. 1st., a letter from Mr. G. C. Round, late Signal officer, U. S. A., urging the necessity of a universal code of simple signals, adaptable to all situations, I beg to say that during the first year of the Rebellion, having invented a system of cast-iron embrazures, for earth works, and sea-coast defenses, which was favorably reported upon by Admiral Dahlgren, of the Navy, and Col. Alexander, U. S. Engineers, a system of signals became necessary for the use of such forts, and after a careful investigation of the various systems in use, I found their complication such as to be entirely beyond the comprehension of the temporary soldiers and sailors, who formed the bulk of our army and navy at that time. I therefore had to devise one, requiring only a knowledge of the alphabet and numerals, and involving the fewest possible flags and signs and the simplest combination of colors.

I found that by means of a red, white, and blue, and a diagonal of red and white flag, four flags in all, a four-sheaved signal block and halyards and a flag staff, all the letters of the alphabet, any combination of numbers from 1 to 100,000,000, might be clearly signaled almost as quickly as they could be read or written, all the flags being run up at once and not lowered or unbent till the operation was over, to make any letter or number it being only necessary to change the relative positions of the flags by hauling them past each other.

The absence of expense and simplicity involved in these signals bring them within the reach of every little fishing smack and coaster, from whom, in time of war, the most valuable information is to be obtained, and as the entire code is arranged to be printed on the face of a compass card, or painted within the binnacle or on the bulwarks, being continually in view, in a short time it would become as familiar to every cabin boy as his A B C.

For night signals, any number from 1 to 10 might be made by four ordinary lanterns placed or hoisted vertically or horizontally, and any letter or any number from 1 to 100,000,000, by five lanterns.

During fogs, guns fired, bells struck, or steam whistles blown, with pauses corresponding to the spaces between the lanterns, served the same purpose.

For boat service, or in situations where bunting cannot be used, a man, by placing himself in twenty-six easy positions, corresponding to letters of the alphabet, could converse with another, as far as these positions could be distinguished by the naked eye or a telescope.

For the use of the navy, a code book being necessary, I took Webster's Abridged Dictionary and numbered every word from first to last. Then by using my numeral 4-flag signals, the President's Message might be telegraphed almost as quickly as by the wires. This also I proposed as the basis of a universal code. The Japanese have only to take the dictionary, put the equivalent words in Japanese, and they could converse with one of our ships without difficulty, and what is better, understand what they were doing and saying. In short, these four simple pieces of bunting might be made the basis of a universal language.

When secrecy is required, the cipher disk, referred to in your issue of June 9th, serves the purpose more effectually than any combination depending upon human thought, which is never without bias and sequence, and therefore liable to be deciphered by some other mind skilled in the art. This little disk for manufacturing ciphers is peculiarly applicable for messages by the Atlantic cable, figures being substituted for letters. Thus, let two parties take a pair of similar dictionaries, number the words according to their fancy, and then arrange their respective disks, and their communications can never be deciphered if not repeated too often previous to a change of cipher. Pike & Co., on Broadway, and Tagliabue, on Pearl street, opticians, manufacture these disks for a trifling sum.

In conclusion, the above-described system has been submitted to competent judges in the United States Navy, and has received their unqualified approval. It will shortly be laid before the Board of Trade, in New York, and the proper authorities in Washington, when I hope that, if common sense, simplicity, and absence of paraphernalia and expense count for anything, it will be favorably received, if not adopted. J. WYATT REID, Consulting Engineer,

104 Pearl street.

Safety Valves.

MESSRS. EDITORS:—In your paper of July 14th, I noticed an extract from the report of the Manchester Boiler Insurance Company. A remark in that report relative to a spring on the top of the safety valve, its danger and inaccuracy, leads me to mention a great fault which exists in our present mode of using a spring balance attached to the lever at one end and at the other to some fixed point. I have noticed that when the steam is blowing off or escaping by the valve being lifted, the balance registers, and there actually exists, a greater pressure on the valve than is desired. For instance, your lever is screwed down to one hundred pounds and the lever from the fulcrum to the balance connection, or point of resistance, is fifteen inches long. Now, to enable the steam to escape when it arrives at the above pressure, the valve must lift. Now supposing that lift to be only one-sixteenth of an inch, and it is generally more, the lever at the point of resistance will move fifteen-sixteenths, or very nearly one inch, which, of course, compressing or elongating the spring of the balance, increases its power, thereby preventing it from acting as a dead weight, as generally supposed. It seems curious that this has been so long overlooked by our practical mechanics, as it can be prevented by making the lever with a double fulcrum. As the lever lifts, of course the inside or short end going down, becomes still shorter, thereby decreasing in power as the spring increases, which by some little experimenting in the proper length of lever to equalize the increased power of spring, will, I think, make a perfect balance, and indeed act as a dead weight. Probably you or some of your numerous correspondents will be able to inform me whether such a balance has been before thought of or made.

EDWARD SAMUEL, Mechanical Engineer.

Philadelphia, Aug. 20, 1866.

An Idea.

MESSRS. EDITORS:—Associated effort with division of labor is a principle indissolubly connected with human progress. Two old men touching hands could reach back to the time when a public mail between London and Edinburg was a doubted experiment, and when the only light in the street was the uncertain flicker of the torch-bearer.

Might not the principle be applied with advantage in civic architecture, where material, labor, and space could be greatly economized by a degree of unity and coöperation in the building of each block, including provisions for power, heat, ventilation, the disposal of refuse and the suppression of fire, vermin, and noxious exhalations?

These desiderata need in nowise encroach on the home sanctuary, and are well worthy the attention of American architects now called upon to restore whole cities from their ashes. G. H. K.

Cincinnati, Aug. 8, 1866.

Poisonous Bites--Mad Stones.

MESSRS. EDITORS:—You may inform your readers that a solution of sal-ammonia and water is one of the best, safest, and surest remedies for snake, spider, mad dog, or any other poisonous bite or sting, and, if applied soon, no trouble can ensue.

Do any of your readers comprehend the great value of the mad stone? I was bitten by a mad dog some twelve years ago, and went to a mad stone, and have had no trouble since. I have got a mad stone that will cure a bee sting while one can hold his breath.

The mad stone is got in that part of a deer called the rennet, and the size is in proportion to the age of the animal. I learned this fact while sojourning with the Indians on the Plains, and my object in giving it to the public is to save suffering, without cost. JOHN SMITH.

New Harmon, Ind.

A Big Snake Story.

MESSRS. EDITORS:—I have often heard of big snake stories, but the *one I am* about to relate is the largest one yet. On the 9th of this month, as a Mr. Prother and I were going to work we saw lying on the ground rail of the fence a large viper snake. I got a rail from the fence and pinned the snake to the ground, and Mr. Prother got another rail and killed it. In killing the old snake we found we had cut a hole in her from which young snakes were crawling out. I took out my pocket knife and commenced killing them. I killed all the young snakes to the number of eighty-one. The old snake was 37 inches long; the young ones were from seven to eight inches long. I am not sure that I got all of the young snakes; some of them may have crawled off unnoticed. Tell me if there was ever anything to equal this. The above can be substantiated by five persons. B.

Iowa City, Iowa, Aug. 11, 1866.

[We have nothing to match this story, and give it up.—EDS.

Encourage the Small Things.

MESSRS. MUNN & CO.:—The last patent granted me (improvement in shovel and tongs, patented July 10, 1866), secured through your able Agency, seemed to me, at first, to be but a small thing; so much so that I almost passed it by unnoticed, though it is, undoubtedly, a great improvement on the old shovel and tongs as they are separated, which it has proved for itself. I have devoted the last three weeks to selling county rights, and have sold eight counties myself, and put in my pocket nearly eight hundred dollars. I now know that it is a success, and feel that lasting gratitude is due you for encouragement in speaking of its merits, so that I proceeded to procure a patent for it. Hoping that you will continue to cherish the day of small things, I am

Very respectfully,

P. D. BRADLEY.

Preston, Md., Aug. 20, 1866.

Breaking of Watch Springs.

MESSRS. EDITORS:—Being a practical watchmaker, I have noticed that mainsprings of watches often break in a few days after they have been taken out of the barrel and carefully cleaned, without straightening them more than their natural elasticity does in being freed from the barrel. If you, or some of your intelligent correspondents, will tell the reason why, you will oblige a gratified reader of your paper. The breaking seldom occurs immediately—usually some days or weeks after the watch is cleaned and set running, and that, too, when the greatest care in recoiling the spring and putting back into the barrel has been observed. Is it due to the unequal wearing away of the enamel? J. CROSS.

Vineland, N. J.

How to Make Soldering Fluid.

MESSRS. EDITORS:—I have lately seen a very neat way of soldering holes in tin ware. A fluid is first applied around the hole, then a bit of solder put over and melted by holding a fluid lamp underneath. I have some curiosity to know what the fluid is, and how prepared. Will you please to answer in the SCIENTIFIC AMERICAN? W.

Worcester Co., Mass.

[The fluid was probably a solution of chloride of zinc. A convenient way of making it is to half fill a bottle with muriatic acid and add bits or scraps of zinc to neutralize the acid.—EDS.

MANUFACTURING IN GEORGIA.—The Louisville *Courier* says:—An intelligent gentleman, a resident of Georgia, furnishes us the information, which we must confess surprises us much, that there are at this time in process of erection in that State seventy-two mills for the manufacture of cotton and woolen goods, some of them for calicoes. This is an astonishing fact, but it is nevertheless the natural consequence of the events of the last five years.

Improved Gun and Projectile.

This gun,—of the working parts of which we give a sectional view in the engraving,—has awakened considerable interest all over the country by its performances at the recent trial at the Government arsenal in Washington. We give a description of the parts. The dotted lines in Fig. 1 show the position of the screw and adjustable breech when the gun is to be loaded. Half a turn of the screw disengages it from the thread in the nut, and it can be easily drawn out and as easily replaced.

There is a slot or mortise through the breech of the gun, at right angles to the bore, and situated about one and a-half calibers from the rear end thereof. The mortise is a little wider than the diameter of the gas ring to be used, and slightly tapered on the rear side. Into this mortise the sliding breech block, A, fits, and through the narrow end of this block is a circular aperture, B, having a diameter equal to that of the loading chamber of the gun, through which, when the block is withdrawn, the charge is passed into the loading chamber. There is a shallow, circular chamber in the face of the breech block, A, to carry the adjustable bearing plate, C. The face, C, is recessed, as seen, to form a chamber to receive the gas deposit, and prevent it from cutting the bearing surfaces when the breech block is operated. The chamber, D, in the rear side of the breech block carries the operating screw, E, which fits into two or more inclined grooves or female threads in the plate, F, which fits into a recess in the rear side of the mortise, and is fastened by a screw, G. The screw, E, is operated by means of the handle, H. The bore of the gun is chambered at I, one to one and a-half inches diameter more than that of the barrel of the gun, and its depth about half an inch, and into this chamber is fitted a curved gas check.

The action of this gas check is similar to that of a ball joint, so that, however placed in its chamber, it will, when the block is shoved home, properly adjust itself upon its bearing, and prevent the least escape of gas. When the handle, H, is turned half round to the right, the breech block is forced out about half an inch by the screw, and may then be easily withdrawn to the position for loading the piece. When loaded, the block is shoved in as far as it will go, and the handle re-turned half round to the left; this forces the block into the exact position for firing, and locks it there. The gas check is permanently located, and self-acting, as well as self-adjusting, and needs to be withdrawn only when time and opportunity admits of cleaning the whole gun. The gas-proof principle of this invention lies exclusively in the action of the gas check upon the bearing in the face of the breech block. Duplicates of these two small pieces accompany each gun, and when one set become injured by long service, or from neglect, it can in three minutes be withdrawn and a new set substituted, which will render the gun as perfect and efficient as when first made.

Official trials with a steel 18-pounder Broadwell gun have just been made at the Washington arsenal. The report admits the entire success of the invention, the mechanism being simple and strong, and having been operated with ease and facility all the time; nor was there the least escape of gas at the breech to be discovered. The results of a competitive trial for accuracy between this gun and the regulation three-inch rifled gun are. at 800 yards, Broadwell gun, absolute deviation from point of impact, 25·4 inches, with solid shot of 18 lbs. and 1¼ lbs. powder; regulation three-inch rifle, absolute deviation from point of impact, 34·7 inches, with solid shot of 10 lbs. and charge 1 lb. powder.

The Committee conclude by saying:—"Could this same principle be successfully applied to sea-coast guns, we think in many situations it would be very desirable."

Several 10-inch Broadwell guns are about to be ordered by the Government, for further trials on a large scale, preparatory to the adoption of the system in case it gives as much satisfaction in the large guns as it has already done in the smaller ones recently tried.

Broadwell's improved projectile (Fig. 2), is designed exclusively for breech-loading rifled ordnance. The invention consists simply in wrapping a cord of suitable size in the several annular recesses in the lead jacket, and rubbing over all pulverized graphite as a lubricator. The object of using the cord is to wipe the bore of the gun at each round, which it does more thoroughly than can possibly be done by hand, and thus dispenses with the labor and loss of time in sponging after each shot, as in the regulation.

A gun may be fired 1,000 rounds, or more, with this shot without cleaning, for the reason that there can never exist more fouling of the bore than is created by the one charge of powder which is burned behind each shot, the fouling of each charge being completely carried out by the succeeding shot.

The success of this peculiar method of packing projectiles is due to the fact that it is applied in short sections. When the cord is wrapped continuously, its displacement, after leaving the bore of the gun, impairs the accuracy of the shot. The packing, applied as here shown, in short sections, comes off simultaneously, and in the shape of tow, and for this reason does not derange the flight of the projectile.

This is an extremely simple invention, and cheaply applied, but is attended with important and valuable results. It was patented June 19, 1866, by L. W. Broadwell, who can be addressed for additional information at Washington, D. C.

Fig. 1

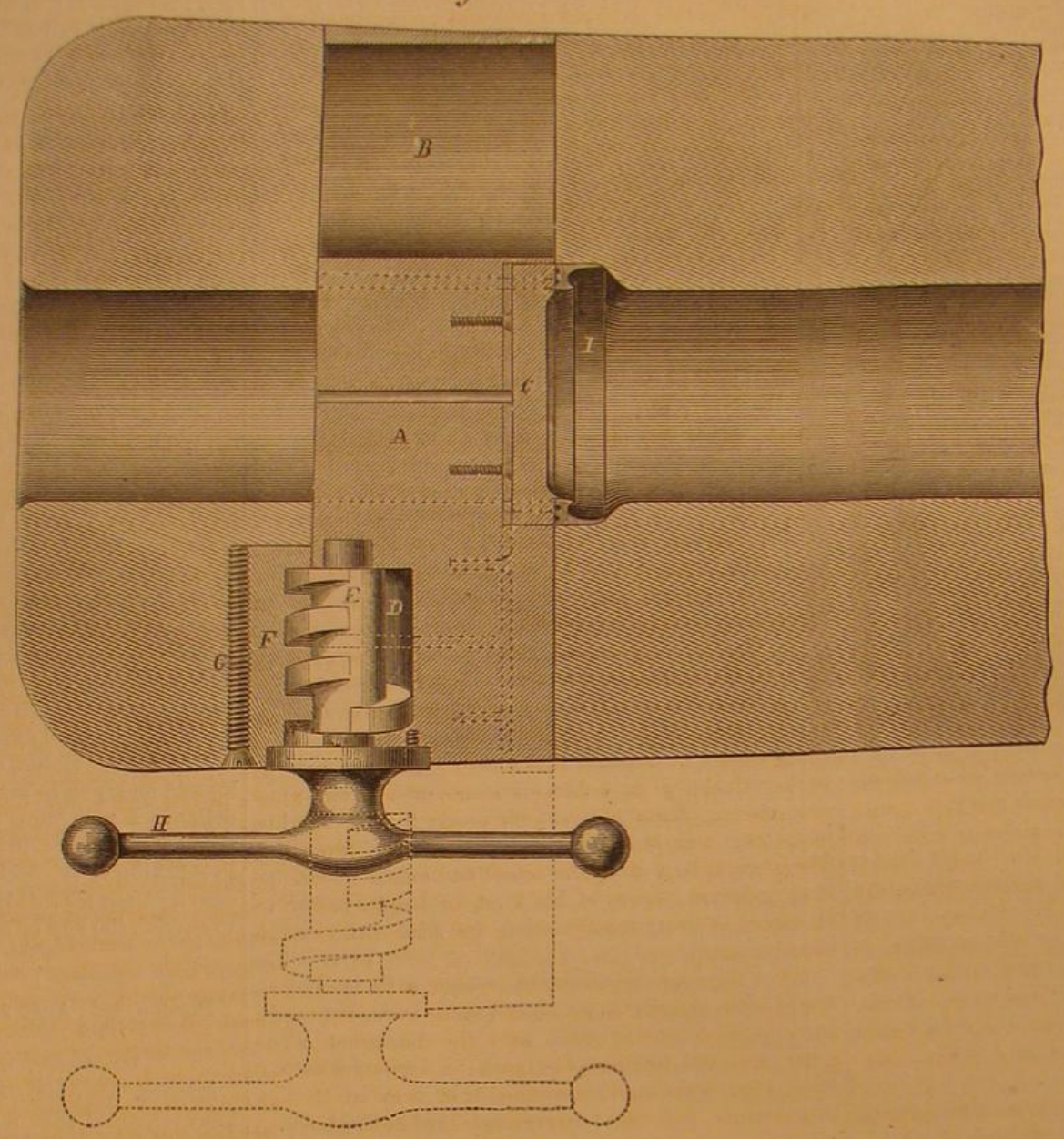
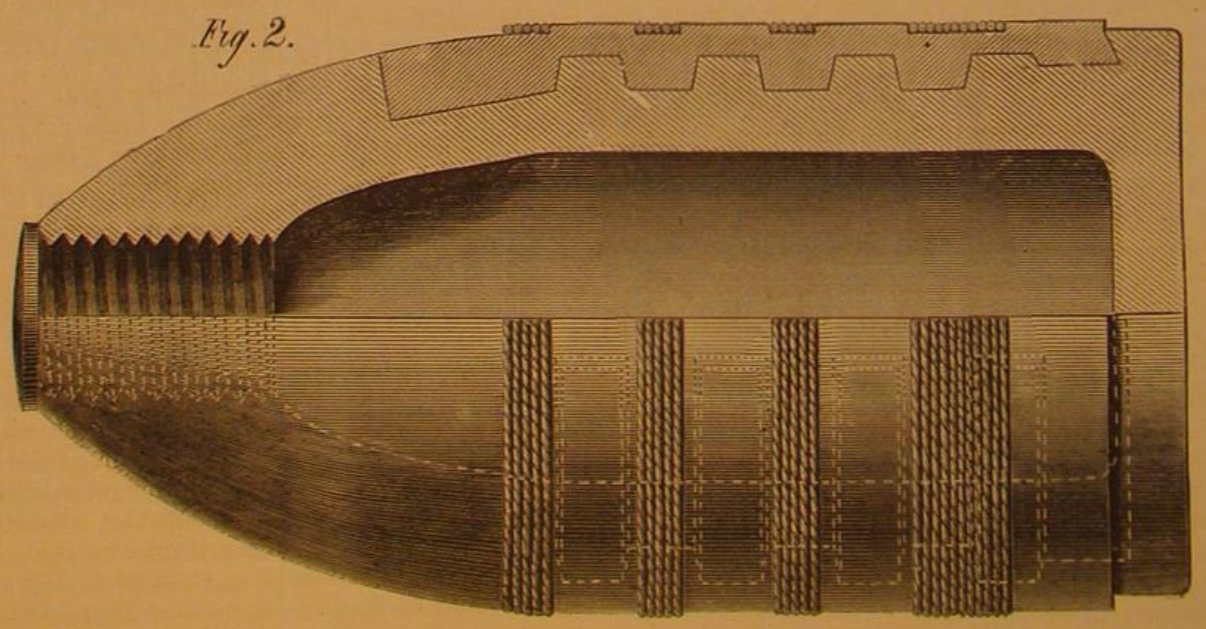


Fig. 2.



BROADWELL'S GUN AND PROJECTILE.

Although the telegraph lines are now so widely extended, the employment of carrier pigeons is not altogether dispensed with. The Duke of Richmond objects to having Goodwood Park disfigured by posts and wires, and consequently, the Electric Telegraph Company employs pigeons to convey messages from Goodwood to the telegraph office at Chichester during the races. At the recent meeting thirty pigeons were employed, and the distance, six miles, was flown in about three minutes and a quarter

THE
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.

☞ 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.

VOL. XV., No. 11, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, SEPT. 8, 1866.

Contents :

(Illustrated articles are marked with an asterisk.)

*Clark's Non-freezing and Non-wasting Hydrant.... 159
The Effect of Sunshine on Fire..... 159
A Life-saving Machine..... 160
Enlargement Test for Ordnance..... 160
Breech-loaders and Patched Rifle Balls..... 160
Sawing Lumber..... 160
Meerschaum and Amber..... 161
The Corn Crop..... 161
Hardening Long Planing Knives..... 161
Miscellaneous Summary..... 161
*Dixon's Planing Machine... 162
The Power of Infection..... 162
The Atlantic Cable..... 162
*Hagenmeyer's Improved Oil Can..... 163
The Lindner and Remington Rifles..... 163
The Peat Manufacture..... 163
The French Exposition..... 164
Insulation of Lightning Rods. 164
Wood on the Prairies..... 164
Timber on the Prairies..... 164
Cement for Millstones..... 164
Saws—Lateral Motion..... 164
How to Banish Fleas..... 164
Simple Code of Signals..... 165
Safety Valves..... 165
An Idea..... 165
Poisonous Bites—Mad Stones 165
A Big Snake Story..... 165
Encourage the Small Things. 165
Breaking of Watch Springs.. 165
How to Make Soldering Fluid 165
*Broadwell's Gun and Projectile..... 166
Carbonic Acid the Most Useful Disinfectant..... 167
The Duty of Recording Experiments..... 167
Transverse Force of Explosive Gases in Guns..... 167
Do Animals Require Salt?... 168
A Kerosene Telegraph..... 168
Skating at the Seaside..... 168
Railroads and Telegraphs in South America..... 168
Improved Well-boring Machine..... 168
Polar Ice and the Gulf Stream 168
Place of the Piston when the Crank is Vertical..... 168
Notes and Queries..... 168
New Inventions..... 169
New Publications..... 169
Special Notices..... 169
Patent Claims, 170, 171, 172, 173, 174
The Markets..... 175
*Tully & Reece's Liquor and Transfer Pump..... 178
Elastic Cartridges..... 178
Improvements in Fire Engines..... 178
White's Mop Wringer..... 178

CARBOLIC ACID THE MOST USEFUL DISINFECTANT.

Carbolic acid has lately come to be a great favorite as a disinfectant. Where its virtues are best known it is more relied on than anything else as a preventive of cholera. There are those who think that if it were liberally used wherever there is unhealthy organic decomposition, miasmatic diseases would soon become unknown. Our very efficient Board of Health, we observe, have added it to their list of disinfectants, and are using it on a large scale. At the next cholera season we predict that it will be better known and be more valued than any other disinfectant.

The reasons why carbolic acid is such an admirable disinfectant are easily to be understood. Miasmatic matter, and almost everything contained in the air which is offensive to the senses, are the products of the fermentation or putrefaction of organic matter. Now, it has been found that carbolic acid is the sovereign and never-failing anti-putrescent and antiseptic. The power of carbolic acid is wonderful for its promptness and its persistence. Putrefaction can neither go on nor be commenced in its presence; it preserves everything *in statu quo*. It is certain that several organic poisons act like a ferment, or are matter in the state of decomposition. Mr. Crookes has shown that the virus of the rinderpest is of this character, and it has long been surmised that the virus of serpents and of contagious diseases belong to the same category. In all these cases, wherever carbolic acid can be applied, it may prove to be a specific.

Chloride of lime acts very promptly as a deodorizer of the air, and to this fact it owes its high reputation. It destroys noxious matter by bringing about a chemical change in it. It enters into chemical union with some part of it, and no longer exists in a state to do more useful work; it is exhausted in doing its work; it is wholly used up. Moreover, chlorine acts by reason of its affinity for hydrogen; and as hydrogen is an element of innocuous matter, it wastes much of its energy where it is not needed. It deodorizes promptly, but where is the evidence that the virus has a foul odor? How do we know that anything beyond the odor is destroyed?

Carbolic acid, on the other hand, goes to the root of the matter. It acts as a preventive. It destroys our enemy in the egg. No noxious effluvia can come from the matter with which it is in contact. It mixes kindly with everything. A very remarkable fact about it is, that in doing its work, there is no chemical change. It remains always free carbolic acid, and the matter with which it is surrounded continues the same as at the first instant of contact. Thus the carbolic acid is never consumed, and may continue forever its office of restraining the demon.

Two simple experiments illustrate the peculiarities of chlorine and carbolic acid. Bring a piece of putrid meat into an atmosphere of chlorine and it comes out sweet. But wait. Observe that it is only the fetid atmosphere about the meat which was affected; let this be blown away, and a new one takes its place. Let the meat be now dipped in a weak solution of carbolic acid and exposed to a current of air. The foul odor is soon blown away, and the meat may continue sweet forever.

Carbolic acid is cheap, and is applicable under circumstances where anything else would be impracticable or objectionable. Thus it may be dissolved in the water used in sprinkling the streets, and relieve us from that peculiar city effluvium which is so noticeable and sickening to those who have just come out of the pure air of the country. It may be used in the washing of the clothing, bedding, etc., of infected persons. It is perfectly safe to be used in the family.

THE DUTY OF RECORDING EXPERIMENTS.

Most experiments in science and art are made with a view of substantiating some particular theory, or of elucidating some supposed fact, and if they fail to do this they are often looked upon as unsuccessful and valueless, and no record is made of what the investigator would consider his failure.

The idea is a wrong one. Every experiment is a success. If it did not result as was desired, it is no less a success than if it answered the most sanguine expectations of the projector. To prove that a thing cannot be done, or that a theory is false, may be as valuable as to achieve success, or establish a proposition. If not of direct advantage to him who made the test, it might be invaluable to others. Therefore, it is a duty the scientific man and practical mechanic owes to his kind, to keep a careful record of every manipulation, and trial with new combinations.

A few days ago an eminent mechanic, in speaking of some investigations he had made in regard to the expansive force of steam, said that he called on a firm who had followed the path of investigation for sixteen years, and ascertained that because the experiments had not determined the facts they sought to establish, they had preserved no record of them, or, if they made such records they had destroyed them. In this case an injustice had been done to other inquirers into the same subject.

The data, the processes, and the results of experiments, from their incipiency to their completion, ought to be carefully noted, and whatever may serve to throw light on the causes of failure, or serve as a means of furthering additional investigations, should be recorded and preserved.

In every thing which is of use to man, the grand, present result is the fruit of the work of generations. It can hardly be estimated how much further we might have advanced if the duty of recording means, object, and result had always been recognized. He who tries a new experiment adds directly to the world's wealth of useful knowledge. That the result did not answer his expectations argues nothing against this proposition. Many of our most valuable discoveries have come from these negative investigations. To prove that an object sought is opposed to the laws of nature and the qualities of matter, may be of as much benefit as to ascertain the converse.

Every experimentalist should bring to his investigations an honest desire to ascertain the truth, even if it proves him to be in the wrong. But many make tests simply to establish and demonstrate a favorite proposition, and, if not successful, carefully destroy all record of what they consider their failure. This is not wise from any point of view. The vocation of our practical men is higher than that of merely distinguishing or benefiting themselves. They work for the world at large, and if by a fortunate discovery or useful invention they make themselves rich, the world receives a larger share of the benefits than they. The inventor of the sewing machine, or those portions which make it a necessity, has been made immensely rich, but his fortune is but dust in the balance when compared with the benefit his inventions have conferred on the world.

It is a rule without an exception, that no man can absorb to himself the full benefit of an invention. He must share it with the mass, and when he selfishly attempts to hide his repeated failures by the light of his one grand success, he does violence to his own conscience and injustice to his fellow men.

TRANSVERSE FORCE OF EXPLOSIVE GASES IN GUNS.

In another column is an article from the *Engineering*, which mentions some facts in connection with experiments with a Whitworth gun, which seem to bear upon the subject of the wedging of confined explosive gases, a subject we have several times referred to before. The experiment was that of leaving an air space of twelve inches in one instance, thirteen in another, between the powder charge and the projectile of the Whitworth 70-pounder gun. The bore of the gun was enlarged at the base of the shot. It could be wished that the record of the experiment had stated whether there was a difference in the recoil of the gun, when fired with this air space intervening between the powder and projectile, and when fired without the intervention of the space. We believe it would be found that the force expended ordinarily in producing a rebound, or recoil, would be directed mainly against the walls of the gun. The test was a severe one for the gun, and it is highly favorable to the credit of the manufacturer.

If it could be proved that the Harding experiments demonstrated the fact, that the temporary compression and confinement of the atmospheric air, or the gas, at the instant of explosion, served the purpose of a breech sufficiently well to give a recoil toward the projectile, without much impairing its initial velocity, we should regard it as an immense stride in the science of gunnery.

Every experiment, or accident, having conditions similar to the trials of the Harding tubes, seems to substantiate the theory that the recoil of a gun can be taken up by a temporary breech of condensed gases. It is certain that guns are burst frequently when the missile is separated from the charge, or when there is an obstruction between the charge and muzzle, leaving an inclosed space. In such a case it seems plain that the action of the explosive is diverted from its course toward the muzzle, and exerts its tremendous power directly upon the walls of the tube.

It is well known that with a very heavy projectile, as in our large guns, quick-burning powder cannot be used. The mass of the projectile, we may imagine, moves sluggishly. It requires an almost inconceivable force to overcome instantly the inertia of the shot, and if the gases are generated too rapidly they jam, or wedge, before they can start the ball. Suppose these gases are allowed a space for expansion in a chamber bounded by the walls of the gun and the breech, which confine them closely, but at another point they find only the resistance of a column of air, backed by a heavy shot; the breech and immediate surrounding walls receive the first impact of the explosion, while in front of the charge, confined air resists the impulse. The explosive force is partially expended on this column of air, which is instantly compressed and forced against the walls of the tube. The particles of air are thus wedged before they can exert their proper force directly upon the projectile.

In the Whitworth experiments, the effect of this instantaneous wedging of the air particles was a permanent enlargement of the bore at the point of impact; that it did not burst the gun is excellent testimony in favor of the manufacturer.

We believe this subject is of importance enough to receive the earnest attention of our mechanics. A series of experiments directed to the elucidation of the action of explosives on a confined column of air, could not be otherwise than beneficial. It is a path that may lead to discoveries which may revolutionize the whole science of gunnery, as at present understood, and possibly give us some new ideas on the subject of boiler explosions.

Do Animals Require Salt.

We find the following paragraph going the rounds of the press:—

"Is salt necessary for horses and cattle? A writer in the *Massachusetts Plowman* and the *California Rural Home Journal* says no. The fine Arab horses won't touch it."

A majority of animals—quadrupeds, at least—seem to have a natural taste for salt, and in a wild state they search eagerly for it. It is not, properly speaking, an acquired taste, for the craving for a saline substance does not grow with the animal, but appears to be as strong when approaching the form of maturity as it is in after years. In a wild state the animal seeks the marshy places, and what are called salt licks become their favorite haunts. If the taste is a natural one, it seems that it would be prudent to gratify it, to a certain extent, at least. We are well aware that many experienced breeders hesitate about feeding salt in the winter months, presenting the argument thus: Salt creates thirst, and cattle should not drink much water in cold weather, as it chills the blood, and requires a greater amount of food to triumph over it and preserve the necessary warmth of body. This, doubtless, is a correct view of the case, but we do not see why the same rule should be enforced in the summer months of our northern latitude. In the tropics salt should be sparingly fed the year round. Milk cows, especially, are benefited by plenty of salt, as water and succulent grasses add to the quantity of milk flowing into the pail morning and night. One of our most experienced breeders recommends rock salt, as the animals lick it and satisfy the natural craving without indulging to excess. In regard to the Arab horse not touching salt, a greater mistake was never committed. The writer has blundered seriously, and this error proves that he is ignorant of the subject of which he pretends to have an intimate knowledge. The Arab horse shows no more aversion to salt than do many other animals. Our race horses, of which he is the ancient progenitor, require salt when undergoing the ordeal of training, and they are benefited by it.—*Turf, Field, and Farm.*

A Kerosene Telegraph.

An apparatus termed a "kerosene telegraph," has been invented in Boston. It consists of two small boxes, arranged with levers for opening and closing apertures of an inch and a half in diameter. An ordinary keorsene lamp was placed in each box with a reflector behind it. One of these machines was taken by Mr. Cyrus A. George (also connected with the office) to a point in East Cambridge, a mile and a half distant from the city hall, and at eight and a half o'clock (the time previously agreed upon) his signals were received by his brother, who was stationed in the fire-alarm office in the cupola of the city hall. He answered them, and they continued to converse with great ease and rapidity for an hour, sending and receiving messages. They found no difficulty in reading as accurately and nearly as fast as by the ordinary means of telegraphing. With this apparatus the inventor believes he could operate easily five miles in clear weather, and by increasing the power of the light, ten or fifteen miles. An experiment will soon be made from the Boston office with some distant point in Roxbury or Dorchester.

Skating at the Sea Side.

The New York Skating Association, under the management of J. L. Plimpton, Esq., patentee of the celebrated parlor skate, illustrated in these columns some time ago, have secured the dining hall and other rooms at the Atlantic Hotel, Newport, R. I., where the sons and daughters of the sojourners at this fashonable resort daily assemble for instruction, and to practice the graceful and healthy art of skating.

Mr. Plimpton is master of the system of physical exercise which he teaches, and which himself and little daughters practice so skilfully, and therefore it is not surprising that wherever he goes he elicits the patronage and commendation of our most distinguished citizens. Mr. Plimpton's skate emporium and exercising Hall in New York is on the corner of Fourth avenue and Tenth street.

WE are informed that a company has been organized at Greenboro, Pa., for the purpose of working some gold discoveries made in that vicinity.

Railroads and Telegraphs in South America.

While the United States and the European countries are continually executing some new plan for promoting the interests and welfare of the people, the nations of South America, though less favored with means, and not disposed to lag behind the spirit of the age, are extending, as far as possible, those great instruments of modern civilization—the railroad and telegraph. The Costa Rican Government has contracted for a chain of telegraphs extending from Punta Arenas, on the Pacific coast, to San Jose, and from thence to a convenient place on the Caribbean Sea. In Chili, internal improvements have been resumed since the departure of the Spanish fleet, and new railroads are being pushed to completion.

Improved Well-boring Machine.

A correspondent from Detroit describes an apparatus for boring wells, which he considers far preferable to the present clumsy mode. It is the invention of Mr. Charles L. Merrill, but from the description we judge it closely resembles one invented by a man named Atwood, which we saw at work in Titusville, Pa., in the spring of 1865. It consisted of a frame which contained a device for griping, turning, and raising the boring bar, and allowing it to drop again. The action of the drill could be determined and adjusted to any point, and no derrick, samson post, nor walking beam was required. For reasons unknown to us it did not supersede the old method, although it appeared to be efficient.

Polar Ice and the Gulf Stream.

M. Grad, in a letter read before the French Academy on the Polar Ice and the Gulf Stream, expressed the opinion that the stream keeps up its identity as far as the north of Siberia, and only loses itself in the Polar Basin. He contended that the pole is by no means always occupied with ice, and that as the waters of the Gulf Stream keep themselves open in the spaces of the glacial seas which they traverse, it is in the prolongation of that current between the Spitzbergen Group and Nova Zembla that we ought to look out for the easiest route by which to arrive at the Arctic geographical pole.

Place of the Piston when the Crank is Vertical.

In our issue of Aug. 11th, we replied, in an indifferent manner, to a question in regard to the position of the piston of a horizontal engine when the crank was vertical. A correspondent, A. S., gives the following rule:—"The hypotenuse of the right-angled triangle formed by the connecting rod and crank, deducted from the sum of the lengths of the two, gives the distance which the piston has receded from the end of the cylinder opposite the crank shaft. This deducted from half the length of the stroke, gives the distance of the piston from the center of the cylinder."

The *Memorial de la Loire* says:—"The change of the gun with which the infantry of the French army is provided has long since been resolved upon in principle; at present the manufacturers, and especially those of St. Etienne, are actively occupied in the fabrication of the new arms, which are smaller in the bore than the gun at present in use, and are loaded at the breech. It will be understood that this change must entail considerable expense. In order to lessen it as much as possible, the Emperor is reported to have authorized the Minister of War to dispose by degrees of the old flint muskets, percussion cavalry carbines, and smooth-bored cannon, as well as the sabers of abandoned patterns, which are in the magazines of the State."

A LABORER engaged at the proof butt in the Royal Arsenal, Woolwich, recently took a draft from a bottle containing what was supposed to be whisky. He was instantly seized with great pain, his body became suffused with a dark blue tinge, and he shortly died. His death was attributed to cholera; but upon the bottle being handed over to the chemical department of the Arsenal it was recognized as having contained about half an ounce of nitro-glycerin used in experimental shell firing. It had been negligently left at the butt after an experiment a few days previousiy.

Notes and Queries

Paul——, of Pa.—The simplest sort of an experiment would demonstrate that glass is a far better conductor of heat than wood, and consequently that wood is preferable to glass as a covering to prevent the radiation of heat.

C. H. L., of R. I.—A metallic mold is the best for casting britannia, but in your case you probably prefer a chesper one. Make one of plaster of Paris and coat the inside with olive oil. The steam boiler you refer to is probably new and "foams" or "primes." Pump but little water in at a time and pump often, and fire carefully. It will remedy itself in time.

F. J. L., of Ill.—Polish the glass with fine sand and water, followed by pumice stone, rouge, or oxide of iron and putty powder.

R. F. L., of Miss.—Sawdust can be burned under any style of boiler. No peculiar construction of the bridge walls is required. It needs a strong draft, and the grate bars should be replaced by flat perforated plates of cast iron. A blower is necessary to force atmospheric air through the mass of sawdust. Its combustion is facilitated by roasting, or drying, in a retort, or oven, having a column of air passing through it. When thus prepared and fed under the boiler gradually, in small quantities, it makes a good fuel for generating steam.

W. J. V., of N. Y.—Loam for forming molds is made of common brick clay and sharp sand or coarse foundery sand. Sometimes brick powder is used with the clay. Cow hair saw dust, horse dung, or chopped straw is mixed with it, to give it porosity and tenacity. The mold must be thoroughly dried or baked before being used. We recommend as a treatise on this subject, the "Molder's and Founder's Pocket Guide," by Overman, published by Henry Carey Baird, 406 Walnut street, Philadelphia.

——, of Del.—An ice house can be constructed of wood, having double studding and walls. The spaces between should be filled with spent tan, sawdust, fine charcoal, or chopped straw, and the inside studdings celled with boards or planks, making an inner wall of inclosed air. The roof should be double, with considerable air space between the two, and the floor should be made so as to readily drain all the water from the ice. The ice itself should be protected with straw laid on thickly and secured with boards.

R. W., of Conn.—The temper of a knife used in paring apples is certainly not injured by the acid. We do not believe there is any acid which will injure the temper of steel when applied to its surface. The temper is a property of the mass, and the acid affects the surface only.—The wood which forms a part of the beaver's dam is so mixed up with mud and stones that it keeps its place. It is said that the beaver plasters the sticks of wood which form the base of the dam with mud expressly to prevent them rising. The skill of the beaver is often exaggerated.—You ask why it is that steel can be melted, while it may be injured by over-heating in a blacksmith s fire. We do not see that the melting and the injury by over-heating having any dependency upon each other, and we conclude that your question is unreasonable.

H. P. B., of Minn.—Dallett, in the "Miller, Millwright and Engineer," directs that mill picks should be heated to a cherry red, dipped in clean water, and the edge drawn only to a whitish color. This is a greater degree of hardness, we think, than most cast steel will stand, and we should prefer trying a pale straw. The edges of the pick should be dipped in yeast or beer grounds, before heating, to prevent cracking. 2. Soap rubbed on steel does not injure the steel.

C. E. W., of Ill.—It is difficult to assign a cause for the behavior of the boiler you speak of. Certainly, if you give us the right measurement, the plates of the boiler were thick enough. As the crown sheets gave way at the rivet line, we are not prepared to condemn the quality of iron used. Rather, we are inclined to attribute the failure of the boiler to a want of proper staying. Although not in possession of all the facts, we think there were no proper stay-bolts between the furnace sheets and the top of the boiler. Internal staying of a boiler, especially where the direct action of the heat tends to disintegrate the iron, is as necessary as external strength. Too little attention is paid to this feature in boiler making.

W. D., of C. W.—The whole power exerted on the propelling screw of a vessel is not utilized. 2. The proportion profitably productive of propulsion is variously estimated by different engineers, and is subject to varying circumstances. More power is exerted in still water, and when the vessel is at rest, than when she is moving rapidly through the water. For this reason, many engineers design propelling screws with an increased pitch, to make up for the slip occasioned by the backward movement of the water, but we do not fully believe in the efficiency of increased pitch screw-blades. 3. The non-feathering wheel looks well in theory, but in practice has not proved advantageous. 4. If the screw traversed an unyielding medium, the progress of the vessel would be exactly conformable with the pitch of the screw, multiplied by its revolution. 5. The feathering side wheel is not considered an economizer of power. The common side wheel is a feathering wheel when the vessel is in motion, and no device has yet been discovered which materially improves upon its performance.

A. L., of Vt.—There is no cement which will unite metal and wood so permanently as nails or screws. For temporary uses a great variety of compositions have been proposed. Where great adhesiveness and the water-proof quality are wanted, we have found melted raw rubber to answer pretty well. Rosin, wax, shellac, oil, etc., may be added to obtain the desired consistency.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees :—

SAFETY PAPER FOR THE PREVENTION OF COUNTERFEITING.—JAMES M. WILCOX, Glen Mills, Pa.—This invention consists in introducing into bank-note, or other paper, at the period of its transformation from pulp to paper, of colored fibers, and interweaving them in such a manner, with the ordinary fibers, as to group them in lines or figures, or in any other peculiar manner. This differs from former devices for the same purpose, which consist in placing threads or colored pulp between two thin sheets; and it has this peculiarity, in which its great protectional quality consists: it cannot be imitated by introducing the colored fibers between cemented sheets, but the plan must be carried out upon a Fourdrinier machine, and during the process of manufacture. It differs, also, from the old French method, which coasists in introducing pigments in lines, etc., into the body of the sheet during its consolidation from pulp, for the pigments can be imitated by external coloring upon paper, whereas colored fibers cannot. We have seen samples of this new paper whose imbedded fibers, by holding the paper before the light, are readily distinguished from mere surface imitation, and we recommend its use as affording one more important safeguard against counterfeiting. Inasmuch as this paper can only be made in a regular paper mill, and only in those comparatively few, mills which possess the Fourdrinier machine, it could not be made without a certain notoriety, involving almost certain detection, if the manufacture should be attempted for unlawful purposes.

FASTENING FOR TRUNKS, BAGS AND VALISES.—W. S. PADDOCK, Albany, N. Y.—This device is the subject of a patent, bearing date, August 21st, 1866. The fastening consists of a fixed and a movable plate, the former having a series of headed pins, and the latter a corresponding number of pear-shaped apertures; the movable plate or slide being adjusted by a knob, so as to place the headed pins in the smaller part of the aperture, and thus fasten the two plates together, or by a further movement of the slide the pins are made to stand in the larger part of the apertures and thus permit the plates to be separated and the bag to be opened. When the plates are fastened together, as above stated they may be locked by forcing the bolt of a common block against a small stop on the slide. These plates, extending the entire width of the trunk, bag, or valise, afford a continuous fastening instead of confining the mouth at one point only; can be cheaply manufactured and applied. Manufacturers and others may obtain any desired information by addressing Mr. Paddock as above.

BOOT AND SHOE EDGE PARER.—WILLIAM FREDERICK, Ashland, Pa.—This invention consists of an instrument formed by combining a holder, cutter, and block or guard with each other, for paring or shaving the edges of boots and shoes without cutting or injuring the uppers.

BURGLAR ALARM AND DOOR FASTENER COMBINED.—F. OAKLEY, London, Eng., assignor to JOHN COLLINS, New York City.—This invention relates to an instrument which will, when applied to a door or window, not only effectually prevent the opening of such door or window, but will also sound an alarm, when an attempt is made to open it.

MACHINE FOR SAWING STONE.—SIMEON SHERMAN, Weston, Mo.—This invention relates to a new and improved machine for sawing stone or rock into blocks with parallel sides and plane surfaces, or with curved sides, the mechanism being arranged in such a manner that the sides of the block may be sawed to any desired angle, and the block of stone adjusted in proper relative position with the saws, without moving it on its bed.

DRILLING ATTACHMENT FOR TURNING LATHES.—JAMES MCCHUM, Locust Grove, Ohio.—This invention relates to a new and useful attachment for turning lathes, whereby articles may be drilled with greater facility than hitherto.

HANDLES FOR CUTLERY.—TAYLOR D. LAKIN, Hancock, N. H.—The object of this invention is to obtain a neat and ornamental handle for cutlery, more especially table cutlery, and one which may be securely fastened on the tang of the blade, and constructed at a very moderate cost.

CORN CULTIVATOR.—H. S. POTTER, Fairfield, Iowa.—This invention consists in a novel construction and arrangement of the framing, plow beams, hounds, driver's seat, etc., whereby the operation of the plows is not affected by the draught, and the inner plows rendered capable of being adjusted or moved with the greatest facility.

DEVICE FOR STARTING CARS.—HENRY H. COVERT, Detroit, Mich.—This invention consists in applying a pinch bar or lever (one or more) to a railroad car, in such a manner that when the propelling power is applied to the car, the pinch bars or levers will be first actuated by such power, and made to operate directly upon the wheels, so that the car will be started with the greatest ease.

HAY-LOADING WAGON.—ANGELOS M. CLARA, Whitney's Point, N. Y.—This invention relates to a new and improved hay-loading attachment for wagons, the device being also applicable for raising and stowing hay in barns.

TIRE SHRINKER.—H. W. CASWELL, Yarmouth, Me.—This invention relates to a new and simple device for shrinking tires for wheels, so as to avoid the cutting and remolding of the same.

PUMP FOR DEEP WELLS.—W. HOAGLAND, New Brunswick, N. J.—This invention has for its object the improvement of pumps for oil and other deep wells, and it consists in the construction of the piston, the piston rod, and its valve.

CULTIVATOR.—CHARLES DANIEL, Lamonte, Mo.—This invention is for an improved corn cultivator, drawn by a double team, having fixed plows running centrally between the rows, and vibrating plows on each side, under the control of the driver, the frame of the cultivator being elevated to straddle the plants.

WORK HOLDER AND SCISSORS SHARPENER.—C. E. STAPLES, Worcester, Mass.—This invention relates to an extremely novel and useful combined holder for cloth, when being sewed, and a device for the sharpening of scissors.

CALIPERS.—PHILO SOPER, Buffalo, N. Y.—This invention consists in a novel construction of self-registering calipers, whereby any deviation from the measure for which the instrument is set, is indicated by a supplementary index.

APPARATUS FOR CARBURETING AIR.—PATRICK MIHAN, Boston, Mass.—The object of this invention is to carburet air, so as to produce an inflammable gas, and consists in certain novel devices whereby the desired result is obtained in an expeditious and economical manner.

BLACKING COMPOUND.—W. F. QUIMBY, Wilmington, Del.—This invention relates to a compound for a blacking for the polishing of boots and shoes, etc.

CIRCULAR SAW.—J. E. EMERSON, Trenton, N. J.—This invention relates to an improvement in circular saws, of that class which are provided with removable or detachable teeth. The object of the invention is to facilitate the adjustment of the teeth in the saw, and at the same time retain all the advantages of previous patented inventions of this kind while avoiding an objection pertaining thereto, which is the weakening of the teeth by the insertion of rivets at the most vulnerable points.

GRAIN-DISCHARGING DEVICE FOR HARVESTER.—ROBERT MORRIS, Salem, Ind.—This invention relates to a new and improved device for discharging grain in gavels from harvesters, and consists of endless carriers in connection with a rotary gavel discharger, provided with a regulating attachment for determining the size of the gavels.

LOCK.—E. R. HOPKINS, New York City.—This invention relates to that class of locks which are susceptible of having the operating parts for throwing the bolt so set and adjusted with regard to each other that to unlock the lock it is necessary to perform a combination of movements corresponding to that performed in the setting of the locking devices.

BAND SAW.—PAUL PEYIBIL, New York City.—This invention consists in the arrangement of an adjustable guide, composed of two jaws connected to a central screw, and provided with a series of shoulders of different width, in such a manner that the guide can be readily adapted to saws of different width, simply by turning it round on its central screw. It consists further in the arrangement of a yielding or elastic support under the adjustable journal box of one of the drums which carry the saw, in such a manner that if the saw strikes a knot or hard spot, the journal box yields sufficiently to prevent the saw from snapping.

OPERATING INDIA-RUBBER SPRINGS.—J. W. WILDER, New York City.—This invention consists in the arrangement of a protecting case and plunger, in combination with a long and comparatively thin piece of india-rubber, in such a manner that when said piece is exposed to a pressure tending to compress its ends, the protecting case prevents the same from doubling up, and retains it in position to sustain the pressure acting on it; and, furthermore, by the protecting case the india-rubber is permitted to expand throughout its whole length, and a spring of great power and activity is obtained at a comparatively trifling expense.

MACHINE FOR STACKING HAY.—WILLIAM LOUDEN, Fairfield, Iowa.—This invention relates to a new and improved machine for stacking hay, and consists in a novel manner of arranging and bracing a crane, and also a novel arrangement of the sweep mechanism, by which the power of the horse is applied to the tackle which elevates the fork, all arranged in such a manner that the device may be readily put up and taken down, and the loaded fork automatically brought over the stack and released, so that it may descend without backing the horse.

BOBBIN FOR SEWING MACHINE.—CORNELIA F. INGRAHAM, Indianapolis, Ind.—This invention consists in constructing a bobbin for use on the Wheeler & Wilson sewing machine, in such a way as that it may be separated into two parts, whereby the operator is enabled to pick out a broken thread, to untangle the thread on the bobbin, or to ascertain the amount, the "number," or the color of the bobbin thread without trouble.

COMPOSITION FOR ARTIFICIAL RUBBER.—WILLIAM T. BOND, Philadelphia, Pa.—This invention relates to a composition which possesses all the properties of vulcanized rubber, and is adapted to all the purposes for which that article is used, such as the manufacture of combs, buttons, etc.

WHIFFLETREE.—D. A. GORHAM, Lawrence, Mass.—This invention consists of the revolving trace hooks and connecting bar or rod, in combination with the whiffletree, and in connecting the whiffletree to the fore part of the carriage, in such a way that the horse can be released from the carriage in an instant whenever necessary.

FENCE.—CONRAD SEABAUGH, San Antonio, Texas.—This invention consists in the peculiar manner of securing the rails to the posts with wires.

WAGON BRAKE.—GEORGE W. CROWE, Cincinnati, Ohio.—This invention is an improved wagon brake, formed by combining the lever brake bars, the connecting lever, the connecting bar, and the operating lever with each other, in such a way that the power applied to the operating lever may act with double force upon the brakes.

CULTIVATOR.—MICHAEL PORTER, C. E. JENKINS, and G. F. JENKINS, Terre Haute, Ind.—This invention relates to an improvement in that class of cultivators which straddle a row, and which are provided with a raised draught pole that passes over the growing plants.

HORSE HAY RAKE.—D. M. DUNHAM, JEREMIAH WEBB, and ALBION WEBB, Bangor, Me.—This invention is a hay rake from which the hay may be readily discharged, and the teeth of which may be readily held away from the ground while the rake is being transported from place to place.

STOVE-PIPE DRUM.—FRANCIS E. RUTH and JOSEPH DE LONG, Upper Sandusky, Ohio.—This invention consists principally in the combination of an interior tapering or thimble-shaped tube, with the exterior drum and interior central pipe, for the purpose of forcing the heat against the outer cylinder; and in the combination of a dish-shaped damper, with the outer cylinder, the tapering tube, and the interior pipe.

WATCH PROTECTOR.—T. W. TERRY, Baltimore, Md.—This invention consists in the arrangement of a plate, provided with a hinged yoke or staple, and constructed so that it can be conveniently secured in a watch pocket, in such a manner that when the guard of the watch is placed between the plate and staple, and the chain fastened to the button hole, as usual, the watch cannot be with drawn.

PRINTING YARN.—EDWARD J. STEPHENS and HIRAM E. GREEN, Pawtucket, R. I.—This invention consists in printing yarn by means of one fluted and one plain roller, the fluted roller being supplied with the requisite quantity of color from a suitable box or trough. The yarn, in passing through between the two rollers, is printed simultaneously on both sides.

CUTTING BOARD.—ROLAND C. HUSEY, Milford, Mass.—The object of this invention is to produce a good and durable cutting board for laying out and cutting leather in the manufacture of boots and shoes.

SHUTTLE CARRIER FOR SEWING MACHINES.—JOHN SHELLABERGER, Hampshire, Ill.—The object of this invention is to simplify and improve the shuttle carrier of sewing machines, which is now an expensive part of the machine, and not distinguished for simplicity either in construction or in the matter of adjustment.

EVAPORATOR.—JAMES LITTLE and S. W. LITTLE, Patoka, Ind.—This invention relates to an evaporator for saccharine juices and other liquids. It is placed on an arch of gradually diminishing size, supported at one end by an adjustable rod, by which the inclination of the pans can be regulated to suit circumstances. The several compartments of the evaporator are provided with inclined skimming shelves, whereby the scum is readily removed from the liquid, and the operation of boiling saccharine and other liquids is materially facilitated.

HORSE RAKE.—CHARLES KUGLER, Cadiz, Ohio.—This invention relates to a new and useful improvement in that class of horse rakes which are provided with wire teeth fitted in a head, which turns in suitable bearings. The invention consists in applying a treadle to the head in such a manner as to counterpoise the teeth, and render the rake capable of being raised with the greatest facility, in order that it may discharge its load, and still be capable of being held firmly down to its work when required.

TREATING SUGAR CANE.—J. C. BELL, Pawnee City, Nebraska.—This invention relates to a new and improved process for treating sugar cane, particularly sorghum, previous to exposing it to the action of the grinding rollers, in such a manner that the vegetable and acrid matters contained in the cane are prevented from getting mixed with the juice, and a sirup obtained of superior quality, not liable to sour.

BANJO.—GEORGE MEIN, Williamsburgh, N. Y.—This invention consists in the combination of an interior rim with the exterior rim and with the head, and in the peculiar manner of attaching the stem to the rim.

HATS, BONNETS, ETC.—WILLIAM S. NELSON, St. Louis, Mo.—This invention relates to an improvement in the construction of hats, bonnets, etc., whereby a constant current of air is allowed to pass freely around the head, keeping it at all times comfortable.

NEW PUBLICATIONS.

NEW PHYSIOGNOMY, OR SIGNS OF CHARACTER. By Samuel R. Wells. New York: Fowler & Wells, No. 389 Broadway.

The comprehensive character of this work will be understood when we state that it contains nearly eight hundred pages and one thousand illustrations. Every shade and shape of nose, eyes, mouth, lips, teeth, cheek, chin, neck, ears, hair and eyebrow, hands and feet, are here represented, with explanations of their languages, value, and significance in the great art of reading character. Given the carte de visite of the individual and the color of the hair, and with this "key to life" in hand, the character may, we suppose, be easily read. The book is full of ingenious comparisons. The structure of the human body is also explained; so are the various temperaments, the outlines of phrenology, the effects of climate on character, the signs of health and disease, the great secret of human beauty, etc. Altogether, this book is a very singular compound of interesting things, and abounds with suggestive topics for ordinary conversation, which render it valuable.

SPECIAL NOTICES.

John Pepper, of Lake Village, N. H., having petitioned for the extension of a patent granted on the 5th day of Dec., 1854, patented in England the 22d day of Nov., 1853, and reissued to said Pepper Dec. 27, 1863, for an improvement in knitting machines, the said petition will be heard on Monday, the fifth day of November next.

Daniel Tainter, of Worcester, Mass., having petitioned for the extension of a patent granted to him on the 30th day of November, 1853, for an improvement in rotary knitting machines, it is ordered that the said petition be heard on Monday the 12th day of November, 1866.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING AUG. 28, 1866.

Reported Officially for the Scientific American.

☞ 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.

57,454.—METHOD OF PREVENTING THE COATING OF PIPES USED IN MASH TUBS.—Albert Adams, Springfield, Mass.

I claim the process herein described of passing cold fluid through the pipes ordinarily used for heating a semi-fluid substance, when the same is used, substantially in the manner and for the purpose herein set forth.

57,455.—MACHINE FOR IRONING HOSIERY.—Walter Aiken, Franklin, N. H.

I claim the hosiery-ironing machine, made as described, viz: of the two hollow drums or cylinders, the flexible connection pipe, the driving shaft and gears, the stationary and movable boxes, tubular journals and stuffing boxes, arranged with and applied to a frame, A, substantially as and for the purpose and to operate as specified.

57,456.—SNAP HOOK.—Charles H. Alsop, Middletown, Ct.

I claim the hooks, B B, secured together at one end, one upon the other, and swiveled at each end to the eye-frame, E, substantially as and for the purpose described.

57,457.—HORSE COLLAR.—Clark Alvord, Westford, Wis.

I claim the mode of fastening the tops of horse collars by an elastic coupling, and for the purposes mentioned, as above described and shown.

57,458.—MANUFACTURE OF BICARBONATE OF SODA, POTASH, AND HYDROCHLORIC ACID.—Haydn M. Baker, Rochester, N. Y.

I claim the application of the principle of double decomposition of chloride of sodium or potassium, and nitrate of lead, for the formation and manufacture of nitrate of soda or potash, and the subsequent application to the manufacture of the decomposition of the said nitrate of soda or potash with silicic acid, for the purpose of forming soluble silicate of soda or potash, together with the utilization of the nitric acid, liberated by said decomposition, in the formation of nitrate of lead with the recovered oxide of lead.

I also claim the application of the processes herein described and set forth, for the recovery of the oxide of lead from the chloride of lead with oxide of magnesium, and subsequent recovery of magnesia by distillation, from chloride of magnesium.

I furthermore claim the application of carbonic acid under any degree of pressure, for the decomposition of silicate of soda or potash, in the manner herein described, for the purpose of forming carbonate, or bicarbonate of potash or soda.

57,459.—EVAPORATOR.—A. Belding, Madison, Ind.

I claim the pan, arranged as described, with the hinged skimmer, C, scum pan, G, cooling opening, J, substantially as described and represented.

57,460.—LAMP-CHIMNEY CLEANER.—William B. Bernard, Waterbury, Ct.

I claim as a new article of manufacture a lamp-chimney cleaner having one or more arms, B B', hinged to a handle, A, and so combined with a spring, D, as herein described, so placed above the hinge or hinges as to force said arms outwardly, all substantially in the manner and for the purpose herein set forth.

I claim, also, corrugating the pads, E E, of a lamp-chimney cleaner, substantially in the manner and for the purpose herein set forth.

57,461.—BRICK.—David L. Bartlett and George H. Johnson, Baltimore, Md.

We claim a brick having bosses projecting from one face thereof and counterpart recesses formed in its opposite face, each at a point midway between the sides, center, and end of the brick, substantially in the manner and for the purpose herein set forth.

57,462.—CONSTRUCTION OF DOUBLE-CYLINDRICAL STRUCTURES.—D. L. Bartlett and George H. Johnson, Baltimore, Md.

We claim granaries, reservoirs, towers, etc., constructed of bricks formed substantially as herein described, and laid in double concentric walls, in combination with metallic tie-plates, substantially in the manner herein set forth.

57,463.—MOLD BOARD FOR PLOW.—GeorgeA. Beard, Cavetown, Md.

I claim the elevation and enlarged extension of the mold board of the plow, as described above, and nothing else or more.

57,464.—POST-OFFICE DELIVERY BOX.—Jacob H. Beidler, Lincoln, Ill.

I claim the combination of the lever lock bolt, C, with its hooked end, h, the corrugated plate, D, with the notch, b, and the sliding plate, E, with its projecting flange, f, and staple, d, all constructed, arranged, and operating substantially as and for the purpose described.

Second, I claim the lever lock bolt, C, in combination with the corrugated plate, D, or its equivalent, when so arranged that said lock bolt may be operated to unlock the door from the outside by means of a key, and from the inside by a movement of the lever, substantially as shown and described.

Third, The combination of the sliding plate, E, with its staple, d, the lever lock bolt, C, and the bell, F, so arranged that the turning of the key to unlock the door will cause the lever, C, to strike and ring the bell, substantially as described.

Fourth, The inclined plane, j', of the corrugated plate, D, in combination with the lever lock bolt, C, so arranged that when the front end of said lock bolt is depressed by turning the key, it will strike the said inclined plane, j', and start the door open, substantially as described.

57,465.—METHOD OF TREATING SUGAR CANE.—J. C. Bell, Pawnee City, Nebraska.

I claim the within described process of treating sugar cane previous to grinding, by exposing the same to the action of boiling water, or steam, or both combined, substantially as and for the purpose described.

57,466.—RATCHET DRILL.—George W. Bishop, Stamford, Ct.

I claim the screw, G, fitted in an internal screw thread in the arbor, A, in connection with the friction device composed of the slotted tube, J, and band, K, or their equivalents, for connecting the screw with the head, I, substantially as and for the purpose pecified.

57,467.—RAILROAD RAIL.—J. L. Booth, Rochester, N. Y.

I claim a rail for railroads composed of the iron body, A, and steel cap, B, when the latter is rolled and shrunk on the body, in such a manner as to unite the parts closely, as a unit or whole, but still allow them to be easily separated and replaced, substantially as herein set forth.

57,468.—ARTIFICIAL RUBBER.—William F. Bond, Philadelphia, Pa.

I claim a compound made of shellac, glue, and borax, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, and flour, substantially as and for the purpose set forth.

Also, a compound made of glue, shellac, borax, flour, and linseed oil, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, and molasses, substantially as and for the purpose set forth.

Also, a compound made of glue, shellac, borax, molasses, flour, and linseed oil, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, molasses, flour, linseed oil, and emery, substantially as and for the purpose set forth.

57,469.—APPARATUS FOR DRYING PEAT.—Hezekiah Bradford, New York City.

First, I claim a series of cars, moved gradually through a heated chamber, and provided with ranges of platforms, holding the peat to be dried, and then cooled, or partially cooled, by the action of the air, substantially as set forth.

Second, I claim the cars for drying peat formed of a series of sectional platforms, in the manner specified, to facilitate the reception and discharge of peat, substantially as set forth.

57,470.—CAR VENTILATOR.—J. A. Caldwell, Springfield, Mass.

I claim the arrangement of the wings, D D, on the outside of the case, C, in combination with the rod, b, packing, g, spring, d, and catch, c, substantially as described.

57,471.—MACHINE FOR GRINDING AND POLISHING BUTTONS.—G. J. Capewell, West Cheshire, Ct.

First, I claim grinding and polishing buttons by means of a machine, having suitable holders for the buttons, and so arranged and operated as to subject the buttons to the action of the grinding and polishing surfaces, substantially in the manner described.

Second, Imparting a rotary movement to the button holders while subjected to the action of the grinding and polishing surfaces, as and for the purpose specified.

Third, So constructing and arranging the button holders with regard to the machine, that, as the machine is operated, the buttons shall be automatically delivered therefrom after having been both ground and polished, or either ground or polished, substantially as described.

Fourth, So constructing and arranging the button holders, with regard to the machine, that, as the machine is operated and the button holders in turn pass to the grinding or polishing surfaces, as the case may be, they shall be automatically so operated upon as to sufficiently lift to clear the edges thereof, and thus prevent their impingement against the same, and then lowered thereto, or brought to bear thereon, with sufficient pressure to produce the desired grinding and polishing of their surfaces, substantially as described.

Fifth, The combination with a common head plate, having a series of one or more holders suitable for the reception of the buttons to be ground and polished, and to which head plates a rotary or other proper movement is imparted, of the grinding and polishing wheels or surfaces, arranged and operating with regard to the said head plate and each other, substantially in the manner described and for the purpose specified.

Sixth, Holding the buttons, in their holders, upon their sides or edges, by means of a spring, or other device, suitably arranged therefor, and substantially as and for the purpose specified.

Seventh, The peculiar construction of the button holders herein described, the same consisting of the hollow shaft, l, with its collar, o, in which the buttons are placed and held, surrounding casing, s, having a coiled or other suitable spring upon its inside, cap or head, t, and center spindle, u, passing entirely through the hollow tube, l, with a spring, w, the whole being arranged together as described and operating as the head plate is revolved, and the upper ends of the button holders pass over and under the fixed arms, f4 and g4, substantially in the manner and for the purpose specified.

Eighth, The combination of the head plate, having arranged upon it a toothed disk, Q, and stationary plate, T, secured to the said toothed disk, Q, by means of a set screw, V2, or other suitable device, with the pinion wheels, S, of the button holders, arranged and operating together substantially in the manner and for the purposes described.

57,472.—MELODEON.—Peter Carbach, Cleveland, Ohio.

First, I claim the bellows, G, valve, a, exhaust pipes, i i', and valve opening, b b' b", in combination with the valve, c, jointed arm, I, link, J, and lever, J, and pedal, B, as and for the purpose set forth.

Second, I claim the bellows, G, arm, M, and link, f, in combination with the two-armed lever, N', valve, N, and spring, g, as and for the purpose set forth.

Third, I claim the valve, a, spring, a', bellows, G, in combination with the induction pipe, b", reserve bellows, F, exhaust bellows, C C', as and for the purpose set forth.

57,473.—FRUIT GATHERER.—J. T. Carpenter, Thompsontown, Pa.

First, I claim the shank, C, provided with prongs, D D, which said prongs are covered with india-rubber, or its equivalent, and constructed substantially as herein represented.

Second, The cords, F F, arranged with the prongs and the ring or loop, E, for the purpose of conducting the fruit to the conductor, G, substantially in the manner herein set forth.

57,474.—MACHINE FOR GROOVING LUMBER.—Merrill E. Carter, Syracuse, N. Y.

I claim the combination of the angular cutters, D D, and the horizontal cutter, G, operating substantially in the manner and for the purpose herein set forth.

57,475.—DEVICE FOR SHRINKING TIRE.—H. W. Caswell, Yarmouth, Me.

I claim the two parallel bars, A A, connected by the screw rods, B B, and provided with the clamps, C C, all constructed and arranged to operate in the manner substantially as and for the purposes herein set forth.

57,476.—GRAPPLING IRONS.—John H. Chapman, Utica, N. Y.

First, I claim the grappling irons with the hooked ends and extension points, or their equivalent, substantially as described for the use and purpose mentioned.

Second, The elevating implement with or without the detaching part, constructed and operating substantially as described for the uses and purposes mentioned.

Third, The grappling irons and the elevating implement with or without the detaching part in combination, substantially as described and for the uses and purposes mentioned.

57,477.—FEEDING TROUGH.—Robert Chesnut, Richmond, Ind.

I claim a feeding trough divided into a series of compartments communicating with one another, and so arranged as to receive the feed simultaneously from a tank located above the trough, the supply being regulated by a valve, G, actuated by a lever, H, the several parts being respectively constructed and arranged for use, substantially as set forth.

57,478.—HAY-LOADING WAGON.—Angelos M. Clara, Whitney's Point, N. Y.

I claim the shaft, G, provided with the pulley, F, with the ropes, L D, attached respectively thereto, in combination with the slide bar, M, applied to the draught pole, N, the upright pole, B, with arm, C, projecting from it, and the levers, H, in which the shaft, G, is fitted, and having the brake or shoe bar, J, attached, all arranged and applied to a wagon to operate substantially as and for the purpose specified.

57,479.—TANK FOR PETROLEUM.—Marius C. C. Church, Parkersburgh, W. Va.

I claim the combination of the tank, A, of the chamber, D, provided with the safety valve, C, and connected by orifices as described and for the purpose of the storage and transportation of petroleum or other liquid.

Second, The tank, A, segment shaped in transverse section, the flat upper surface forming the floor of a secondary chamber.

57,480.—ANIMAL TRAP.—Daniel Cole, Ornell, Pa.

I claim the treadle, c, arranged within the box, A, with the rod, d, springs, s and m, door, e, windlass, y, and cords, z z, by which means the animal is lowered into the under chamber of box, A, closing the door through which it entered and imprisoning itself after passing through the gates, g, into the supplementary chambers, when arranged in the manner herein specified.

57,481.—HEAT RADIATOR.—Jessie Conger and John Borthwick, Philadelphia, Pa.

First, I claim the heat radiator composed of metallic disks permanently attached together and combined with the body or fireplace of any stove or any device or devices, substantially the same, for the purpose and in manner above described.

Second, The combination of our heat radiator with cylinder P', for the purpose and in the manner aforesaid described.

57,482.—HORSE RAKE.—A. J. Curtis, D. J. Roberts and W. Curtis, Swanville, Monroe, Me.

We claim the arrangement and combination of the gears on the wheels with the rack bars and their operative mechanism as described, applied to the rake head and the axle, the whole being substantially as specified.

57,483.—FANNING MILL.—H. W. Curtis, Lockport, Ill.

I claim the combination of the bar, J, shafts, I, pins, m n, and suspenders, L, with the shoe, v v, shaft, H, and slot, K, substantially as described.

57,484.—CULTIVATOR.—Charles Daniel, Lamonte, Mo.

First, I claim the jointed handled and vibrating cultivator, h h, in combination with the plow beams, c c, the axle, B, and hounds, a a, constructed and operated substantially as and for the purposes herein described.

Second, I claim the suspended plow beams, c c, in combination with the hounds, a a, and the stirrups, d d, constructed and operated substantially as and for the purposes set forth.

Third, I claim the arrangement of the oblique hanging hounds, a a, in connection with the center beam, A, the plow beams, c c, the side braces, e e, and the axle, B, constructed and applied substantially as and for the purposes herein specified.

Fourth, I claim the arrangement of the swinging seat, c, on the center beam, A, in combination with the vibrating cultivators, h h, and their jointed handles, m m, applied in connection therewith, substantially as and for the purposes herein described.

57,485.—CLOTHES WRINGER.—J. C. Dicky, Saratoga Springs, N. Y.

I claim two cores with alternate depressions and elevations meshing with each other through their entire length, in combination with the rubber covering that conforms both externally and internally to the inequalities of the core.

57,486.—PRINTING PRESS.—Andrew Dougherty Brooklyn, N. Y.

I claim the combination in a printing press of the following instrumentalities, viz: the printing cylinder, reciprocating carriage for flat printing surfaces, inking apparatus therefor, impression cylinder for curved printing surfaces, inking apparatus therefor, and carriage for the inking apparatus, all operating in the combination substantially as set forth.

I also claim the combination in a printing press of the following instrumentalities, viz: the printing cylinder, reciprocating carriage for flat printing surfaces, two impression cylinders for curved printing surfaces arranged at opposite sides of the main printing cylinder, two inking apparatuses therefor, and two carriages for the inking apparatuses, all operating in the combination substantially as set forth.

57,487.—HAND TRUCK.—Samuel R. Dummer, New York City. Antedated Aug. 17, 1866.

First, I claim the combination of the elastic studs, b, and wheels, D, constructed and arranged in the manner and for the purpose herein specified.

Second, The combination of the flexible washers, h, and hubs, g, arranged in the manner and for the purpose herein specified.

57,488.—HORSE RAKE.—D. M. Dunham, Jeremiah Webb, and Albion Webb, Bangor, Me.

First, I claim the combination of the ratchet wheel, H, pawl, N, or equivalent, and sleeve, J, with each other, and with the wheel, F, to which they are attached and by which they are operated, and with the shaft, C, which they operate, substantially as described and for the purpose set forth.

Second, The combination of the springs, P and O, and bent rod, R, with the pawl, N, for the purpose of causing the pawl to engage with the ratchet wheel, substantially as described.

Third, The combination of the stop, S, with the pawl, N, for the purpose of disengaging the pawl from the ratchet wheel, substantially as described.

Fourth, The combination of the bent lever, U, with the frame of the rake and with the shaft, C, substantially as described and for the purposes set forth.

57,489.—APPARATUS FOR PREPARING PEAT.—Louis Elsbery, New York City.

I claim the combination in a machine of the following implements, viz: the agitator, agitator chamber and steam pipe, all operating in the combination, substantially as set forth.

I also claim the combination in a machine of the following implements, viz: the chamber for the material, steam delivery pipe, and reciprocating piston press, all operating in the combination, substantially as set forth.

I also claim the combination of the piston and piston chamber of the press with a discharge passage composed of sections all operating in the combination substantially as set forth.

I also claim the combination in a machine of the following implements, viz: the agitator, agitator-chamber, steam delivery pipe, and reciprocating piston press, all operating in the combination, substantially as set.

I also claim the combination of the piston and piston chamber of the press with a discharge passage whose interior is tapering; all operating in the combination, substantially as set forth.

57,490.—STEAM-ENGINE GOVERNOR.—Rudolf Eickemeyer, Yonkers, N. Y.

First, A governor consisting of an escapement and a balance making isochronal vibrations connected with the valve, by which the speed of the moter is controlled, so as to regulate the motive power, substantially as herein described.

Second, The combination of the escapement, D, balance, H I, and friction spring, d, or their equivalents, with the valve, in such manner that the latter may cease moving after the supply of motive power has been entirely shut off, and before the normal speed of the motor is restored, substantially as herein set forth.

Third, The arrangement of the lever, L, with graduating weights, connected with the escapement and balance by means of a loose strap, w, substantially as and for the purpose herein specified.

Fourth, The spring, d, applied to produce friction between the escapement wheel and its shaft, and to insure the falling of the pallets of the verge or anchor on the teeth of the said wheel, substantially as herein specified.

Fifth, The counterbalance lever, N, in combination with the valve and escapement, substantially as and for the purpose herein specified.

Sixth, The governor consisting of the escapement and balance, the friction spring, d, weight, s, counterbalance, h', stops, c' d', and their connections, the whole constructed, combined, and applied substantially as herein specified.

57,491.—APPARATUS FOR GENERATING GAS.—J. J. Ensley, New York City.

I claim the construction of the perforated charge cylinder or cylinders, d, open at the inner end, and the horizontal close retort cylinder or cylinders, c, substantially as and for the purpose herein specified.

I also claim the condensing chambers, k k, connected by the pipes, l l, and provided with discharge cocks, m m, when used in combination with the inclosing water tank, B, substantially as described.

I also claim the combination and arangement of the tight bar-

rel, q, and pipes, p r, with the pipe, n, for the purpose of pumping off the condensed water that gathers, without admitting air or allowing escape of gas, substantially as set forth.

57,492.—Coal and Ash Sifter.—Warren R. Evans, Thomaston, Me.

First, I claim the combination of the ash receiver, B, with its perforated plate, c, with the vessel, A, substantially as specified.

Second, In an ash sifter constructed substantially as set forth, the pins, c c, in combination with the plate, C, substantially as and for the purpose specified.

57,493.—Boot and Shoe Edge Parer.—William Frederick, Ashland, Pa.

I claim an improved boot and shoe edge parer, formed by combining the holder, B, cutter, A, and block, E, with each other, the said parts being so constructed and arranged substantially as herein described and for the purpose set forth.

57,494.—Funnel Measure.—Chauncey W. Fuller, Earlville, Ill.

I claim a measuring funnel constructed with a valve, C, raised by the bent rods, D, with a spiral spring, E, and lever, F, and having also transverse rods, B, for measuring quantities, said several parts being respectively constructed and arranged for use in relation to the funnel and to one another, substantially as set forth.

57,495.—Stem-winding Watch.—E. A. Giles, New York City.

I claim the sleeve, e, and pin, f, combined with each other and with the winding arbor, c, pendent ring, C, and spring catches, n, substantially as herein set forth for the purpose specified.

57,496.—Twine Spool and Stand.—George P. Goodwin, Lowell, Mass.

I claim as a new article of manufacture a twine spool and stand composed of the hanger, bushings, friction centers and thumb screws, all arranged to operate substantially as and for the purpose set forth.

57,497.—Whiffletree.—D. A. Gorham, Lawrence, Mass.

First, The revolving trace hooks, D, and rod or bar, c, constructed as described, in combination with the whiffletree, A, substantially as described and for the purpose set forth.

Second, Connecting the whiffletree, A, to the forward part of the carriage, in such a way that the horse can be released from the carriage in an instant whenever necessary, substantially as described and for the purpose set forth.

Third, The spring pin, H, constructed as described, in combination with the strap, F, slotted bar, G, and lever, E, substantially as and for the purpose set forth.

57,498.—Fastening for Railroad Rails.—E. B. Graff, Baltimore, Md.

I claim a railroad rail, A, having its ends constructed as set forth, in combination with the saddle, D, plate, P, and bolt fastenings, as described, the whole being constructed, arranged, and operated substantially in the manner and for the purpose described.

57,499.—Pump.—John P. Gruber, New York City.

I claim the application of a valve, b, to a rotary spiral flange for the purpose of elevating water, substantially as described.

57,500.—Sewing Machine.—William H. Halsey, Hoboken, N. J., and Maurice Fitzgibbons, New York City.

First, We claim the combination and arrangement of the spring, E, and arm, D, with its cam end, a, constructed and operating substantially as and for the purposes set forth.

Second, Forming the handle of the machine so that it will contain and support the spool, substantially as described.

57 501.—Turn Table.—Freeman Hanson, Hollis, Me.

I claim a turn table operated in an inclosed pit by the weight of the car or engine to be turned, as and for the purpose described.

57,502.—Apparatus for Generating and Burning Gas from Petroleum, Naphtha, etc.—Mark E. Hanson, Newport, Me.

I claim the hereinbefore described arrangement of a gas generator and burner consisting of the generator, a a, with the ribs, b, the eduction pipe, d, perforated cap, f, together with the hinged spring, h, and pin, i, the said several parts being constructed and the whole combined for use, substantially as and for the purpose set forth.

57,503.—Lock.—William W. Hardee, New York City.

I claim the combination of the doubly-hooked tumblers, D E F G, key and rotating slotted post, L, when constructed, arranged, and operating as and for the purpose set forth.

57,504.—Car Coupling.—Andrew Hartman, Canton, Ohio.

I claim, First, The arrangement of the hook, D, the crank rod, E, the rod, F, with its stop, and the plate, G, constructed and used as and for the purpose specified.

Second, The arrangement with the bumper, A, of the springs, B and C, with their ends forming portions of bottom and top of the receding mouth, as and for the purpose specified.

Third, The arrangement of the crank shaft, I, provided with prongs, J J, with the spring, C, and hook, D, the several parts being constructed substantially as and for the purpose specified.

57,505.—Uterine and Abdominal Supporters.—Joseph S. Havens, T. M. Johnson, and C. W. Howe, Buffalo, N. Y.

We claim, First, In providing the joint of the uterine supporter with a rack, a set screw, and a segment of a pinion, as described, by means of which it may be either locked in position or swung loosely upon the rod, U, as described.

Second, In making the tube, P, with the supporting ring, L, adjustable vertically by means of the set screw, Q, and the tube, P', as described.

Third, The combination of the ring, M, with the ring, L, of said supporter, when constructed as and for the purposes set forth.

57,506.—Pipe Tongs.—Henry Herbert, Cincinnati, Ohio.

First, I claim the adjustable pipe tongs constructed with a toothed pin, C G, substantially as and for the purposes set forth.

Second, I further claim the adjustable gage, consisting of the sliding collar, O, and set screw, N, when constructed and arranged to operate as and for the purposes specified.

57,507.—Tug Buckle.—Henry Hise, Ottawa, Ill. Antedated Feb. 28, 1866.

I claim as an article of manufacture a buckle composed of the two parts, A and C, when the former has a projecting pin, a, and is secured to the latter by means of a spring, G, attached to C, said frame, C, having at its end, L, a loop, to which the tug strap is attached, so that the other part of the frame, C, remains uncovered, all said parts being constructed in the manner and operating substantially as described and for the purpose set forth.

57,508.—Lock.—E. R. Hopkins, New York City.

I claim the combination with the handle shaft and the bolt of a lock of two separate series or sets of concentric rings or disks, one of which series, by its holder or frame, is so connected with the handle shaft as to always turn with it, while the other series is susceptible of being brought in connection with or disconnected from the said first series, when the two series of rings or disks are so constructed and arranged with regard to each other and with the handle shaft and lock casing as to allow the bolt of the lock to be drawn out or thrown in only by properly moving the handle therefor, after said disks have been brought to certain positions with regard to each other, substantially as herein described, and for the purposes specified.

I also claim adjusting the operating parts of the lock herein described for throwing its bolt in accordance with a graduated disk attached to the handle shaft, and turning in connection with it and the annular fixed graduated ring of the lock casing, when such graduations of the said disk and ring are so arranged with regard to each other that only one of the said graduations of both the ring and disk can coincide with each other at one and the same time, substantially as herein described and for the purpose set forth.

57,509.—Automatic Steam Valve.—George W. and Elisha Hopkins, Brooklyn, N. Y.

We claim the combination with a piston valve constructed substantially as described, of the sliding rings, S S', arranged and operating in connection with the valve heads and their necks, to produce the operation of the valves by steam from the cylinder, essentially as herein set forth.

57,510.—Calendar Clock.—Henry B. Horton, Ithaca, N. Y.

First, I claim the cam or sliding surfaces on the month cam, I, for the purpose of sliding or revolving the thirty-one-days wheel the distance of one day, for the object described; and the said surface for one day's advance of the said wheel for any other purpose connected with the supernumerary days of a calendar clock.

Second, I claim making a four, eight, twelve or more year wheel, containing virtually the uses and position of the wheel, P, moved by the pin or part, P c, or equivalent, and controlled by the bent rod, a, or equivalent, and its surfaces, P a and P b, etc., as described. And I claim the wheel, P, when made of eight slots, six plain and two irregular surfaces, as described, or other correlative number of parts, periphery, slots, and surfaces, when made substantially as described. And I claim the February cam, c c', constructed on the year cam, Z, for leap year, as described, both when used in combination with the wheel, P, and when used with any other device or mechanism in place of the wheel, P.

Third, I claim the immediate contact, or other suitable connection, of the pawl, n a, with the pawl, K, for the purpose of rendering its action more sure, as described; and the so shaping the upper surface of the pawl, n a, as to act as a cam surface with the pawl, K, and thus be in mutual relation at all times to each other, as described.

Fourth, I claim attaching the lever, S, to the weight lever, n, in such a manner as to receive the action of the eccentric, A, by the rod, B, and by its cam surface, S c, to carry the pawl, K, over the teeth of the thirty-one-days wheel, as described. And I claim the lever, S, or its equivalent, for the purpose of raising a pawl over one tooth of the thirty-one-days wheel, and also of the year wheel and of the days of the week wheel, while in the act of making their changes. And I claim the raising or tilting of the stop pawl, K, or correlative pawls of the week and year wheels over the teeth acted on by the same, when produced by the fall in changing of their respective rods or levers.

Fifth, I claim making the pawl, T, with a slot in it for receiving the lever of the month cam, thus simplifying and making more sure in action the devices connected therewith.

57,511.—Clock Case.—Henry B. Horton, Ithaca N. Y.

First, I claim the combination of the two cast frames, one for the back and the other for the front of the case, with the interposed piece or part between them, as described.

Second, I claim holding the cast frames and middle piece together by the bolts or rods, G, or other equivalent device, as described.

Third, I claim the use of the wooden plugs, in connection with the connecting rods or bolts, for the described purposes and uses, and the use of the said wooden plugs in the holes of the frames for adjusting the fronts and backs when the rods are not used.

Fourth, I claim the combination of frames and interposed middle piece, rods and wooden plugs in the said holes, the same making a whole, as described.

57,512.—Hydraulic Engine.—Horace Hubbell New Haven, Conn.

I claim the combination of the cylinders and their appendages with the sector and its appendages, when the whole is so constructed, arranged, and fitted that the jet of water will alternately be forced into the lower end of one cylinder to act on and elevate its piston, while the lower end of the other cylinder will be entirely open for the discharge of the water and the descending of the piston, substantially as herein described and set forth.

57,513.—Cutting Board.—Roland C. Hussey, Milford, Mass.

I claim the manner of clamping together two or more seasoned sections, A B, that is, by using two bars, C, and rods, D, carrying nuts, c, by which the section may be held closely together, substantially as specified

57,514.—Sewing-machine Bobbin.—Cornelia F. Ingraham, Indianapolis, Ind.

I claim constructing the bobbin of a sewing machine substantially in the manner and for the purpose above set forth.

57,515.—Vault Light.—George H. Johnson, Baltimore, Md.

I claim the combination of inverted or centrally enlarged girders, c c, with elongated glasses, A A, in the construction of a vault cover, substantially in the manner and for the purpose herein described.

Also, the arrangement and combination of retaining strips over and upon the joints of the glasses and frame of an illuminated vault cover, to secure said glasses and protect the joints from moisture, substantially in the manner herein set forth.

57,516.—Pump.—Niels Johnson, Ripon, Wis.

I claim the arrangement of chambers, K and M, with the sucker, G, and valves, E H and I, substantially as and for the purpose herein specified.

57,517.—Centrifugal Machine.—Jacob O. Joyce, Dayton, Ohio.

I claim, in combination with a centrifugal sugar separator, a revolving feeder, operating substantially in the manner and for the purpose described.

57,518.—Steam-engine Valve.—Wm. A. L. Kirk, Hamilton, Ohio.

First, I claim the combination of the valve chamber, A, and continuously revolving valve, H, provided with ports, substantially as described, and for the purpose specified.

Second, The combination of the cut-off valve, L, with the chamber, A, valve, H, and its ports, constructed and operating substantially as and for the purpose specified.

57,519.—Dress Elevator.—G. Kammerl and D. L. Bollermann, New York City.

We claim the combination of the supplemental operating cords, h, with the lifting cords, n, and the operating cords, g, substantially as herein set forth, for the purpose specified.

57,520.—Horse Rake.—Chas. Kugler, Cadiz, Ohio.

I claim the combination of the jointed parts, d d', front foot-piece, e, rear foot-piece, e', cross-bar, G, and arm, F, of the rake head, D, arranged and operating substantially as described, for the purpose specified.

57,521.—Handle for Cutlery.—Taylor D. Lakin, Hancock, N. H.

I claim the central cast-metal plate, A, cast on a core, to form a longitudinal taper opening, a, to receive the tang, B, of the blade, and also cast with projections, b c d, at each side, in combination with the side-piece, D D, secured to A by rivets, and the tang also secured in the opening, a, by rivets, substantially as and for the purpose herein set forth.

57,522.—Machine for Holding the Heads of Casks.—Joseph D. Leach, Penobscot, Me.

I claim the disks, O and P, in combination with the pin, W, constructed and operating substantially as and for the purposes specified.

Second, A heading holder, having levers, B and C, spring, E, ratchet, I, treadle, H, disks, O and P, and pin, W, constructed, combined, and arranged substantially as and for the purposes set forth.

57,523.—Evaporator.—J. Little and S. W. Little, Patoka, Ind.

First, We claim the central supporting framework, E, in combination with the arch, B, pan, D, and adjustable leg, F, constructed and operating substantially as and for the purpose described.

Second, The flaring sides of the arch, with recesses or grooves, a, in combination with the pan, D, substantially as and for the purpose set forth.

Third, The skimming shelves, g, in the pan, G, as described.

Fourth, The V-shaped shelves, I, in the compartment, H, as set forth.

Fifth, The straining shelves, k, and box, l, in the compartment, I, as and for the purpose described.

57,524.—Machine for Applying Screw Mouth-pieces to Cans, etc.—Henry O. Lothrop, Milford, Mass.

I claim the mouth-piece supporting machine, as composed of the jawed plates and the shelf, made, arranged, and combined substantially as specified.

I also claim the arrangement and combination of the lever, K, with the handle, I, and the spring catch, H, applied to the two jawed plates, as specified.

57,525.—Hay-stacking Device.—William Louden, Fairfield, Iowa.

First, I claim the bracing of the upright, A, of the crane by means of the bars or braces, B C C, arranged substantially as described.

Second, The sweep, M, provided with the pendent pin, e, in connection with the arm, J, and fork tackle, all arranged to operate substantially as and for the purpose set forth.

Third, The arranging of the crane and tackle relatively with the arm, J, and with the stack and load, in such a manner that the fork in ascending and descending will, under the pull of the tackle, swing from the load over the stack and vice versa, substantially as described.

57,526.—Water-closet Valve.—Archibald and James Loudon, Boston, Mass.

We claim the combination of the passage, a, through the spindle or post, G, with the regulating screw, M, provided with a recess, e, as described.

Also, the combination of the cushioning channel, c, and its opening, b, with the valve, B, and its seat, I, when combined with the valve, D, and the chamber, A, so as to operate therewith, as specified.

57,527.—Bronzing Machine.—John K. Lowe, Cleveland, Ohio.

I claim the bronze box, F, feed roller, F', and handle, G, in combination with the bronzing fur roller, B, as and for the purpose set forth.

Second, I claim the revolving brush, E, and cleaning roller, D, in combination with the sheet roller, C, and bronzing roller, B, arranged in the manner and for the purpose substantially as set forth.

Third, I claim the belts, H H', and pulleys, d e e' f f' a' b b', in combination with the sheet roller, C, arranged and operating in the manner and for the purpose set forth.

57,528.—Composition for Putty.—John and William H. Lucas, Philadelphia, Pa.

We claim the composition of ground marble, whiting, and linseed oil to form a superior putty, substantially in the manner hereinbefore described.

57,529.—Screening and Sifting Apparatus.—Sebeus C. Maine, Boston, Mass.

I claim as an improvement in apparatus for screening and sifting for family use, the shaft, B, constructed with its guide plates, E, or their equivalents, for receiving and operating a seive or screen of any size or form, substantially as described.

I also claim for family use a seive or screen with its removable bottom in combination with a receptacle provided with a shaft operated by a cam, C, or its equivalent, substantially as set forth.

57,530.—Railroad Wedge Rail.—W. M. Martin, New York City.

I claim the wedge-shaped auxiliary rail with a curved face and three downward-bearing surfaces, one bearing on the clamp, D, one on the bottom of the chair, and one, which is curved lengthwise, upon the lower flange of the rails, substantially as and for the purposes herein set forth.

57,531.—Pump Piston.—Sylvester G. Mason, Elbridge, N. Y.

I claim the combination of the segmental side valves, D D, with the central plane-sided chamber, G, said parts being arranged in connection with the inclosing rim, A, and cover, C, as described, and the whole operating as set forth.

I also claim the construction of the segmental valves with plane sides and a circular rim or edge, as described, for the facilities of manufacture, as set forth.

57,532.—Carpet-cleaning Machine.—William McArthur, Philadelphia, Pa.

First, I claim the combination, substantially as described, of a steam pipe, G, or other equivalent heating apparatus, with a carpet-beating machine, for the purpose described.

Second, The combination of the beaters, H, their spiral springs and the roller, F, with its pins, n, the whole being arranged and operating substantially as and for the purpose specified.

Third, The inclined plates, I i, beaters, H, brush, J, and rollers, B B' c c' d and e, the whole being constructed and arranged for joint operation, substantially as and for the purpose specified.

57,533.—Machinery for Cutting Oval Holes in Boiler Heads.—James McBride, Alleghany City, Pa. Antedated Aug. 17, 1866.

I claim the combination and arrangement of the wheels, k and j, shafts, h and i, disk, g, table, c, pitman, e, wrists, o, slots, f, and cutter, x, combined, arranged, and operating substantially in the manner herein described and for the purpose set forth.

57,534.—Machinery for Cutting Oval Holes in Boiler Heads.—James McBride, Alleghany City, Pa. Antedated Aug. 17, 1866.

I claim the combination and arrangement of the wheels, l m n and o, shafts, h i and k, disk, p, slot, Q, wrist, q, pitman, E, head piece, f, and cutter, g, constructed, arranged, combined, and operating substantially as herein described and for the purpose set forth.

57,535.—Hoisting Machine.—James McCalvey, Philadelphia, Pa.

First, I claim the combination of the grip levers, I, spring, K, keys, L, and springs, M, arranged and operating in relation to each other and to the permanent ratchets, E, substantially in the manner hereinbefore described and for the purpose set forth.

Second, The combination of the trip levers, H, with the yoke, F, beam, C, and grip levers, I, substantially as described and for the purpose specified.

Third, The combination of the spring, O, with the beam, C, and yoke, E, for giving an instantaneous drop to the latter when the rope or chain breaks and thus throwing the grip lever, I, instantly into connection with the permanent ratchet, E, to securely lock the cage, A, substantially as described.

57,536.—Drilling Attachment for Turning Lathes.—James McCrum, Locust Grove, Ohio.

I claim the sliding rod, I, with the spring, O, and weighted cords, L, either or both applied to it, in connection with an adjustable stop mechanism composed of the bar, K, attached to the rod, I, and a head, i, on the slide, Q, all being arranged and applied to the puppet head of a lathe, to operate in the manner substantially as and for the purpose set forth.

I also claim the calipers, P, applied to the tube, E, and slide, Q, in combination with the drilling attachment, substantially as and for the purpose specified.

I also claim the particular arrangement of the slide, Q, tube, E, vise, J, spring, O, and weighted cords, L, with the puppet head, C, of a lathe or drilling mandrel, substantially as and for the purpose set forth.

57,537.—Farm Gate.—David McCurdy, Ottawa, Ohio.

I claim as an improvement in gates the arrangement of the post, A, roller, d, and pin, o, in combination with the extension bar, f

latch, n, slotted swiveled post, l, roller, m, bars, s, and post, A2, constructed and operating in the manner herein specified and described.

57,538.—Wagon Brake.—John S. McGlumphy, Wind Ridge, Pa.

I claim in combination with the rubbers, F, and levers, D, the bifurcated bar, C, and adjusting nuts, E, the same being respectively attached to the lower end of the king bolt, B, and to the brake levers, D, substantially as and for the purpose set forth.

57,539.—Seal Lock.—Ward McLean, New York City.

I claim a lock whose bolt has two catches which simultaneously engage with or disengage from the hasp and from the seal cover so that a seal cannot be removed from the lock without unlocking the same, substantially as described.

57,540.—Banjo.—George Mein, Williamsburgh, N. Y

I claim, First, The interior rim, c, in combination with the exterior rim, A, and with the head, B, of the banjo, substantially as described and for the purpose set forth.

Second, The manner of attaching the stem, I, to the rim, A, with a dovetailed groove and strip, substantially as herein described and for the purpose set forth.

57,541.—Thrashing Machine.—James H. Melick, Albany, N. Y.

I claim, First, a series of bars each fitted to yield separately and radially and forming the concave or rubber, in combination with the revolving thrashing cylinder, as set forth.

Second, I claim a yielding incline, d, between the feeding table and the concave or rubber, substantially as and for the purposes set forth.

Third, I claim the arrangement of the slides, k, springs, l, and adjusting screws, l, to the yielding bars, f, of the concave or rubber, as specified.

57,542.—Tool for Splitting Bark upon Trees.—E. Michaels, Palermo, Me.

I claim a tool for peeling off the bark of trees, consisting of the shank, A, the three-edged knife, B, handle, C, two hand rollers, a and E, substantially as shown and described.

57,543.—Apparatus for Carbureting Air.—Patrick Mihan, Boston, Mass.

I claim, First, An apparatus for carbureting air, conducting the air to be treated through an inlet tube, M, placed about the shaft of the apparatus and terminating near the remote end of the apparatus in a cone-shaped mouth, M', so as to increase the distance to be traversed by the air after it is delivered within the generator, substantially as shown.

Second, I also claim in an apparatus for carbureting air, the use of open tubes supplied with bristles, or their equivalent, revolving through or in a bath of hydro-carbon and exposed, on emerging therefrom, to currents of air, substantially as shown.

Third, I also claim the cover, Q, with its outlet pipe, Q', its cones, P and O, and tubes, U, constructed and arranged substantially as sho n and described.

Fourth, I also claim forming a space, V, for receiving the carbureted air, in combination with the tubes, C, and the cone, O, and tubes, U, substantially as shown.

Fifth, I also claim covering the tubes, C, with an absorbing material for the purpose of exposing to the fresh air a surface or surfaces wet with hydro carbon, while such air is on its way to the end of said tubes, substantially as shown.

57,544.—Stovepipe Damper.—Richard S. Miller, Battle Creek, Mich.

First, I claim the construction and arrangement of the two inverted half cones, C C', pivots, b b, crank shaft, B g, and link, h, in combination with the stove pipe, A, as herein described and shown for the purpose set forth.

Second, The combination of the pivots, b b, notches, e e, and rock shaft, B g, in the construction of a damper formed of two inverted half cones, and arranged in a stove pipe, all as herein described and for the purpose set forth.

57,545.—Burial Case.—William K. Miller, Canton, Ohio.

I claim making and carbonizing burial cases of wood, as and for the purpose substantially as herein described.

57,546.—Water Elevator.—Jacob E. Moeller, Terre Haute, Ind.

I claim the combination of the bucket, E, strap, D, pulley, C, ratchet wheel, R and m, crank, K, and spring catch, n, the whole being constructed, arranged, and operated substantially in the manner and for the purpose set forth.

57,547.—Wrench.—Isaac Morris and C. M. Morris, Fair Haven, Conn.

I claim the combination of the movable jaw, and vibrating rack, with the main rack, and enlargement of the bar, near the stationary jaw, when the whole is constructed and fitted for use, substantially as herein described and set forth.

57,548.—Carriage.—J. J. Morris, New Bedford, N. J.

I claim, First, The independent axle, C, having the hub and wheel attached permanently thereto, and revolving with the wheel, substantially as set forth.

Second, The independent axles constructed as set forth, in combination with the sleeve, H, when arranged to operate as shown and described.

Third, In combination with the axles, C, as described, I claim the friction rollers, a, arranged and operating as set forth.

Fourth, I claim the combination of the brace, o, hook, h, and spring, m, when said parts are arranged in connection with the vehicle, as shown and described.

57,549.—Reaping Machine.—Robert Morris, Salem, Ind.

I claim, First, The square, h, and spring, H, operating with the discharger, F, substantially as and for the purpose specified.

Second, The index, K, and set screw, i, in combination with the spring, H, arranged with the bar, G, and square, h, substantially as described for the purpose specified.

57,550.—Dry Dock.—John W. Munger and W. O. Jones, Portland, Me.

I claim, First, The combination and arrangement of the docks, D 1 2 3 4 5 6, with the channel, B, and central basin, A, as and for the purposes set forth.

Second, The arrangement and construction with the docks, as described, of the cisterns, 7 8 9 10 11 12, in the manner and for the purposes set forth.

Third, In combination with the docks so arranged and constructed, the ways and carriages, outlets and gutters, as and for the purposes set forth.

57,551.—Apparatus for Generating Illuminating Gas.—Henry B. Myer, Philadelphia, Pa.

I claim, First, The arrangement of the chambers, A B C D, in their relation to each other, for the purpose specified.

Second, In combination with the chambers, A B, I claim the pipe, b, and valve, b', constructed and operating substantially as and for the purpose set forth.

Third, I claim the herein described construction and arrangement of the pumps, E F, the same being adapted to the use of water as a packing, as specified.

Fourth, I claim such a structure of the pump, as shown in Figs. 18, whereby it is adapted to the use of quicksilver as a packing, as specified.

Fifth, I claim in combination the perforated coil, C', double disk, d, and perforated disk, I, arranged to operate as specified.

Sixth, In combination with the chambers, A B C, I claim the glass tube indicators, a' b''' k, as and for the object set forth.

Seventh, I claim operating the valve, b', by means of the float, B', as and for the purpose herein specified.

Eighth, I claim the arrangement of the pumps, E F, train of heels, G, ratchet wheel, R, lever, Q, and gas holder, O, as and he purpose herein specified.

57,552.—Harvester.—Wales Needham, Rockford, Ill.

I claim, First, The head, H', spool, K, face plate, J'', in combination with the arbor, m, crank, P, spring, l, reins, a' a'', arranged as and for the purpose set forth.

Second, The arm, B, rest, E, lever, I', tooth, e', spring, d, in combination with the spool and reins, arranged as and for the purpose specified.

Third, The standard, A, and arm, B, in combination with the serrated coupling, C, and rest, E, as and for the purpose set forth.

57,553.—Fruit Picker.—John Neff, Jr., Pultney, N. Y.

I claim the blades, A and B, when made substantially as specified, also the griper, C, and spring, D, when made and applied as specified, and used for the purpose set forth.

57,554.—Hat.—William S. Nelson, St. Louis, Mo.

I claim the arrangement of the band, A, the connected side frames and rim frames with the hoops, E and G, substantially as described and for the purpose herein set forth.

57,555.—Covered Button.—Nelson C. Newell, Springfield, Mass.

I claim the disk, C, formed in such a manner that when inserted in the button it may be expanded laterally, substantially in the manner and for the purpose herein described.

57,556.—Saw Mill.—Isaac H. Newton, Oakfield, Mich.

I claim the bars, G, arms, H, and frame, I J K, combined with each other and arranged in relation to the head and tail blocks, B B', substantially as herein set forth for the purpose specified.

57,557.—Sorghum Stripper.—David H. Nichols, Richmond, Ohio.

I claim the combination of the sliding plates, F, stationary plate, B, provided with apertures, c, and the springs, d, the whole being constructed, arranged, and operating substantially as herein set forth for the purpose specified.

57,558.—Piano.—John W. Otto, St. Louis, Mo.

I claim, as my improvement in the pianoforte in general, and also in the grand pianoforte in particular, First, The particular manner in which the case of the piano (including wrest-plank, iron frame, plane of stringing and soundboard) is inclined, contracted, elevated, and the area of the soundboard enlarged for the purpose of attaining convenient dimensions, a more effective soundboard, and other improvements resulting from this transformation, and claimed herein separately, substantially as described.

Second, The removable end casings, F F, as described and for the purpose specified.

Third, The removable back casing, g, as described and for the purpose set forth.

Fourth, The key lid, k, its joints, n n, and their connecting rod, m, arranged as described and for the purposes specified.

Fifth, Apertures, r, in the soundboard, serving as passages through which the damper movement is transmitted, as set forth.

Sixth, The soft-pedal arrangement by means of a jointed rail, J, and india-rubber slips, K, or its equivalent, substantially in the manner and for the purposes set forth.

Seventh, Setoffs, M M, on each side of the keyboard, in the manner set forth and for the purpose specified.

57,559.—Disinfector.—J. D. C. Outwater, New York City.

I claim the combination of the glass vessel, C, with a depression on its bottom, and a metal cap furnished with hollow arms, the whole being adapted to revolve in adjustable bearings in a frame, substantially as described and represented.

57,560.—Bed Bottom.—Joshua D. Patton, Davenport, Iowa.

I claim a bed bottom composed of a series of cords or other lines, c, secured at one end to the frame of the bed bottom and passing loosely through the other, having heads, E, upon their outer ends, substantially as and for the purpose described.

57,561.—Medicine.—W. Petre, New York City.

I claim the within described medical composition, made of the ingredients in the manner and proportion as set forth.

57,562.—Cultivator.—Michael Porter, C. E. Jenkins, and G. F. Jenkins, Terre Haute, Ill.

I claim the combination of the adjustable swivel brackets, a, plow beams, E E, and axle, A, arranged and operating in the manner as and for the purpose herein specified.

57,563.—Corn Cultivator.—H. S. Potter, Fairfield, Iowa.

First, I claim the frame, A, with the driver's seat, B, placed on its rear end, and connected at its front end to the hounds, D, of the draught pole in front of the axle, E, substantially as and for the purpose set forth.

Second, The frame, J, in combination with the plow beams, L L, connected by swivel joints to the rod, K, above the axle, E, arranged in connection with the frame, A, to operate substantially as and for the purpose specified.

Third, The lever, Q, attached to the front part of the frame, A, and applied to or arranged in connection with the frame, J, and the loop, l, with roller, m, substantially as and for the purpose set forth.

Fourth, The connecting of the plow standards, G M, to the frame, A, and beams, L, by means of the pivoted bars, b g, provided with wheels, c h, substantially as and for the purpose specified.

57,564.—Knife and Scissors Sharpener.—T. T. Prosser and James Lawson, Chicago, Ill.

We claim the toothed disk, B, in combination with the frame, A, having the notch, e, formed therein, when said parts are arranged to operate as and for the purpose set forth.

57,565.—Saw Mill.—Paul Pryibil, New York City.

First, I claim the changeable guide, F, for the purpose set forth.

Second, The construction of the guide, F, with shoulder, e, screw, f, nut, h, spring, j, and jaws, c d, substantially as and for the purposes described.

Third, The yielding spring arms, b, or their equivalent, in combination with the adjustable journal box of the shaft, B, substantially as and for the purpose set forth.

57,566.—Car Coupling.—Samuel Y. Quest, Wellsburg, W. Va.

I claim the combination of the levers, G G' H J K and M, together with the inclined plane, N, when properly constructed and adapted to each other, so as to secure the object proposed substantially as hereinbefore explained.

57,567.—Blacking.—W. F. Quinby, Wilmington, Del.

I claim a blacking composed of the within ingredients in the manner and about the proportion, substantially as described.

57,568.—Potato Digger.—George Ray, Kinderhook, N. Y.

First, I claim the horizontal rotating cutters, C, fixed cutters, C', and guard, C*, arranged in combination with each other and with the shovel plow, D, substantially as herein set forth for the purpose specified.

Second, The suspended plate, D*, combined and in relation with the vibrating screen, D', and with the buckets of the endless elevating apron, u u', substantially as herein set forth for the purpose specified.

Third, The endless elavating apron u u', furnished with buckets as described and arranged in relation with thevibrating screen, G, and the hopper, F', substantially as herein set forth for the purpose specified.

Fourth, The arrangement of the platform, H, at the rearmost end of the machine and in relation with the hopper, F', and vibrating screen, G, substantially as herein set forth for the purpose specified.

Fifth, The suspension of the shovel plow, D, from the vertically pivoted frame, B', to enable the said plow to be turned laterally when desired, substantially as herein set forth.

Sixth, The lever, k, short levers or arms, j, links, l*, and chains, l', arranged with reference to each other and with the bars, i, of the plow, D, and the rearwardly projecting end of the draught pole, B, substantially as herein set forth for the purpose specified.

Seventh, The supplemental tilting frame, F, sustaining the platform, H, and so arranged upon the rearmost end of the machine and combined with suitable operating mechanism, that its rearmost end will be raised simultaneously with the elevation of the forward end of the machine, substantially as herein set forth for the purpose specified.

57,569.—Propeller for Canal Boats.—Ebenezer Raynale, Birmingham, Mich.

I claim a vessel constructed with a submerged recess, A, at the stern, divided through part of its length by a partition, B, and having in one of its compartments, A2, a reciprocating propeller, D, constructed with valves, E, the said parts being respectively constructed and arranged for use, substantially as set forth.

57,570.—Valve for Water Closets.—Joshua Regester, Baltimore, Md.

First, I claim constructing a valve, G, of the parts, g h and i, and arranging it within a box through which water flows, substantially as described.

Second, The continuation of the enlarged cupped portion, g, having flattened spaces, l, and the reduced cylindrical guide, h, with the packing, i, said parts being arranged within a chamber, A, and above the outlet chamber, substantially as described.

Third, The stem, D, constructed with the parts, d, on it as described in combination with the device, h j, in the manner and for the purpose described.

57,571.—Machine for Grinding Tools, etc.—N. B. Reynolds, Auburn, N. Y.

I claim in combination with a revolving grindstone a tapping instrument which on being vibrated hacks the surface of the stone and thus prevents it from glazing or polishing, constructed and operating substantially as herein described.

I also claim in combination with a pair of clamping tongs that are pivoted to a plate or rest traversed by grinding ways which extend past the face of the stone, a tappet or cam, m, for vibrating said tongs upon its pivots, substantially as herein described.

57,572.—Stovepipe Drum.—Francis E. Ruth, and Jos. De Long, Upper Sandusky, Ohio.

First, We claim the combination of the interior tapering or thimble-shaped tube, F, with the exterior drum, A, and interior central pipe, I, substantially as herein described and for the purpose set forth.

Second, The combination of the disk-shaped damper, J, rod, K, and lever, L, with each other and with the outer cylinder, A, the interior tapering tube, F, and the interior pipe, I, substantially as described and for the purpose set forth.

57,573.—Churn.—Geo. H. Sanborn, Boston, Mass.

I claim the arrangement of the two sets of floats, 1 and 2 and 3 and 4, in the manner and for the purpose set forth when combined with the truck, C, the shaft, A, and the cream box, B, as shown and set forth, as also the use of the arms, k k k, and the projections, l l l, when arranged and used as shown.

57,574.—Lock.—James Sargent, Rochester, N. Y.

I claim the rotating tumbler, I, when separated and isolated in action from the permutation wheels, and so arranged that any inward pressure upon the bolt will be exerted on the bearing of said tumbler, and have no action nor effect upon the said permutation wheels, substantially as and for the purpose herein specified

I also claim in combination with the turning tumbler, I, the cog bar, H, and lever, G, arranged as operating as herein set forth.

I also claim the combination and arrangement of the wheels, C, cam disk, E, pivoted lever, G, cog bar, H, and turning tumbler, I, the whole operating as herein specified.

57,575.—Steam Generator.—Herrman S. Saroni, Marietta, Ohio.

First, I claim the arrangement of the feed water pipe in a coil beneath the boliers in and around the burners, as and for the purpose described.

Second, The combination substantially as described of the boiler, the branch pipe, the feed water pipe, and the burners, for the purpose of securing a circulation in the boiler, as set forth.

Third, The arrangement of the burner with its conductors in contact with the boiler, so that the boiler forms the heater cap for the burner.

57,576.—Feed-water Heaters for Steam Generators.—Herrman S. Saroni, Marietta, Ohio.

First, I claim the generator drum, A, arranged between the feed pump and boiler, as described.

Second, The arrangement of the drum and burner so that the drum serves as the heater-cap for the burner, as described.

Third, The arrangement of the drum, the burner and the feed pipe, substantially as and for the purpose described.

Fourth, The combination substantially as described of a series of generators or drums each having its own burner and entrance, and exit pipe, but all having the same main feed pipe and escape pipe.

57,577.—Apparatus for Steaming Vegetables, etc.—Herrman S. Saroni, Marietta, Ohio.

I claim as a new article of manufacture, a steaming apparatus, having one or more apertures, each or all of them covered with a hood, as above described, connecting with a boiler, for the admission of steam, and a separate pipe for the escape of the water of condensation.

57,578.—Vapor Burner.—Herrman S. Saroni, Marietta, Ohio.

First, I claim a vapor burner having a series of conductors surrounding the jet, but without a heater cap, substantially as and for the purpose described.

Second, The combination of the burner and conductors with removable ring and heater cap, substantially as and for the purpose described.

Third, As a new article of manufacture, a vapor burner or heater having the upper or heat generating portion made of metal of high conducting power, while the lower or fluid converging portion is made of metal of lower conducting power, as described, for the purpose of concentrating the heat at the generating or vaporizing point.

57,579.—Steam-engine Slide Valve.—Thomas Sault, New Haven, Ct.

First, I claim a valve suspended from the axles of the rollers, substantially in the manner and for the purpose herein set forth.

Second, The adjustable saddle plates, m m', adjusting screws, n n', and bridge pieces, l l', in combination with the slide valve, rollers and axle, substantially as described, for the purpose specified.

57,580.—Grain Meter.—William Schnebby, Hackensack, N. J.

I claim a grain meter so constructed and combined with a velocity-registering apparatus that the velocity which a body of grain moving through the meter imparts to its grain wheel will be correctly registered, whereby the weight of the grain which has thus passed through the machine may be correctly ascertained.

Second, I claim a grain hopper and trough supported upon a shaft or journals, upon which they may oscillate, in combination with a grain wheel, so that a quantity of grain moving in said hopper and trough and upon said wheel will have the effect to start, operate, and stop a velocity-registering apparatus, by which means the weight of different qualities of grain may be correctly determined.

57,581.—Fence.—Conrad Seabaugh, San Antonio, Texas.

First, I claim an improved fence formed by securing the rails, B, to the posts, A, with wires, C, said wires being arranged and applied substantially as described and for the purpose set forth.

Second, Securing the ends of the rails, B, to the posts, A, by a series of receivers formed of a single wire, C, extending from the bottom to the top of the post, said wire being attached to the post either by passing it through the post or securing it with nails, substantially as described and for the purpose set forth.

Third, Forming each receiver of a separate piece of wire, the

ends of which are passed through the post and secured thereto, substantially as described and for the purpose set forth.

57,582.—CHURN.—Oran W. Seely, Buffalo, N. Y.

I claim the removable and adjustable dashers when used in combination with one or more washers, as herein substantially set forth.

I also claim the wedge and openings, in combination with the removable and adjustable dashers and washers, for the purpose and substantially as herein described.

57,583.—HARVESTER.—John F. Seiberling, Akron, Ohio.

I claim the arrangement of the cut-off rod, D, with the crank arm, G, and arm, I, substantially in the manner described, so that the first movement of the rod in falling will be downward and away from the leaning grain, substantially as and for the purposes set forth.

57,584.—BUTTON-HOLE CUTTER.—G.H. Seymour and W. R. Barnard, Waterbury, Ct.

We claim one or more set screws so combined with one-half or division of a pair of shears as to work through said division against the bearing surface of the other division, to determine the lateral adjustment of the two, and of the cutting blades thereof, with reference to each other, substantially in the manner as herein set forth.

We also claim an adjustable bearing strip or washer upon one division of a pair of shears combined with two set screws in said division, bearing against said strip or washer, substantially in the manner and for the purpose herein described.

57,585.—SHUTTLE CARRIER FOR SEWING MACHINE.—John Shellenberger, Hampshire, Ill.

I claim the shuttle carrier, A, made substantially as described, with a socket near its rim for the shuttle, and a hinged gate, D, which confines the shuttle and covers the bobbin, said gate being provided with suitable means for locking and unlocking the same, as above set forth.

57,586.—MACHINE FOR SAWING STONE.—Simeon Sherman, Weston, Mo.

First, I claim the bed, K, hung or arranged substantially as shown and described, to admit of being turned and also of being adjusted out of a horizontal plane, for the purpose specified.

Second, The spring, N, and patterns, M M, in combination with the frame, F, and the frame, G, provided with the saws, H, substantially as and for the purpose set forth.

Third, The sleeve, a, applied to the shaft, B, in combination with the cords or chains, I, counterpoise, E, and suspended frame, F, containing the saw frame, G, substantially as and for the purpose specified.

57,587.—LAMP.—A. G. Smith, Jersey City, N. J.

I claim the reversible burner, B, constructed substantially as described, to be used in lamps or lanterns, as set forth.

57,588.—CALIPERS.—Philo Soper, Buffalo, N. Y.

First, I claim placing a yielding foot on one of the legs of a calipers, substantially as above set forth.

Second, I also claim the supplementary index, D, for indicating the movements of the yielding foot, substantially as described.

Third, I also claim the combination of the yielding foot, A, to arm, H, and the thumb set screw, J, substantially as set forth.

Fourth, I also claim the combination of the graduated table, C, the index, D, and the yielding foot, A, substantially as shown.

57,589.—LAMP.—Thomas E. Sparks, Norwich, Conn.

I claim the combination, as well as the arrangement, of the elevator or wire, i, with the lamp, A, and the tube, B, applied to the wick tube of such lamp, in manner and so as to operate substantially as described.

I also claim the combination of one or more standards, g g, or the equivalent thereof, with the lamp, A, the tube, b, and a mechanism applied to such tube for suspending or supporting it, whether such mechanism be composed in part of the flame guard, B, or the same and the disk, e, or be otherwise properly constructed so as to hold up the tube and allow the lamp and its wick to descend within the said tube for reduction of the flame, as specified.

I also claim the combination of the flame guard, B, with the tube, b, and the lamp.

I also claim the combination of the disk, e, with the flame guard, B, the tube, b, and the lamp.

I also claim the combination of both the elevator and the bail (or their equivalents) with the lamp and the slide tube, b, provided with means of arresting the upward motion of such tube on and applied to the wick tube so as to operate with respect to the wick thereof, substantially as specified.

I also claim the combination of the flame guard, B, or the same and the disk, e, with the elevator and the bail (or their equivalents) the lamp and the slide tube, b, provided with means of arresting the upward movement of such tube and applied to the wick tube, and so as to operate with respect to the wick, substantially as specified.

57,590.—HEDGE TRIMMER.—Wilson and Hiram Sperry, Trivoli, Ill.

We claim the hinged beam, d, having the knife bar attached thereto, as arrranged, whereby it may be elevated or depressed by the lever, g, and vertical notched bar, h. substantially in the manner and for the purpose as herein set forth.

Second, The arrangement of the circular saw, M, and circular bar, N, in connection with the finger bars, n, arranged substantially in the manner and for the purpose as herein set forth.

Third, The application of a circular plate, M, provided with saw teeth and suitable fingers, n, arranged and operating substantially in the manner described.

Fourth, The combination of the circular plate, M, with the knife bar c, the one operating simultaneously with the other, substantially in the manner as described.

Fifth, The arrangement of the foot lever, C, on the shaft of the driving wheel, B, substantially in the manner and for the purpose as herein described.

Sixth, The arrangement of the driving wheel. B, large cog wheels, D, two smaller ones, G G, large beveled cog wheel, H, and smaller beveled one, I, on crank shaft, J, substantially in the manner and for the purpose as herein set forth.

57,591.—COMBINED SEWING-WORK HOLDER AND SCISSORS SHARPENER.—Charles E. Staples, Worcester, Mass.

I claim a combined cam-formed cloth holder for sewing purposes and a scissors sharpener, all constructed substantially as described.

57,592—MACHINE FOR PRINTING YARN.—Edward J. Stephens and Hiram E. Green, Pawtucket, R. I.

We claim the use in machines for printing yarn of the plain roller, B, and fluted roller, B', in combination with each other, and with suitable color rollers, substantially as and for the purpose set forth.

57,593.—GRUBBING MACHINE.—W. W. St. John, St. Louis, Mo.

I claim the combination and arrangement of the roller, A, with the hounds or braces, B B, the springs, b b, and the pole, C, substantially as and for the purpose set forth.

57,594.—ARTIFICIAL ARM.—Ignatius Stoffel, Washington, D. C.

First, I claim the construction of the last or outer articulations or joints, or means of operating the outer or last phalanges, by the steel bands without the guide, substantially as shown and described.

Second, Pivoting the thumb and lever connecting therewith at the second joint, in the manner and for the purpose substantially as described.

Third, The construction, arrangement, and operation of trigger, n, in combination with levers, x x, connecting rods, h and k, substantially as described.

Fourth, The adjustable band, o, when constructed and arranged as described.

Fifth, The bent or bell-crank lever, l, constructed and arranged to operate as and for the purpose described.

Sixth, The loops or rings, s and t, when arranged as and for the purpose described.

57,595.—PUMP.—Ransom E. Strait, West Oneonta, N. Y.

I claim, in combination with the suction tube, A B, having apertures, P P, the thimble, F, with its openings, O O, constructed and operating in the manner and for the purpose set forth.

57,596.—EGG BEATER AND LIQUOR MIXER.—E. C. Strange, Taunton, Mass.

I claim the combination of the piston, C, tube or cylinder, A, and one or more perforated or wire gauze plates, B, substantially as herein described and for the purpose set forth.

57,597.—SKATE.—Wm. A. Sutton, New York City.

I claim the clamping bar, E, furnished with an inwardly projecting spur, m, when pivoted at or near the center of the heel plate, C, in combination with the adjustable bars, D, furnished with spurs, e, substantially as described.

57,598.—LADY'S FAN.—Billy Todd, Reading, Pa.

I claim a fan consisting of the handle, 1, body, 5, and spring joint, 2 3 and 4, constructed and adapted for operation substantially as described.

57,599.—EXPANDING CHEESE HOOP.—Robert Van Horn, Northfield, Ohio.

I claim the herein described devices for contracting or expanding the hoop, consisting of the strap, D, and roller, E, or their substantial equivalents, the several parts being constructed, arranged, and operating as and for the purpose set forth.

57,600.—INDIA-RUBBER CAR SPRING.—Richard Vose, New York City.

I claim springs for railway cars and other purposes, formed by the combination of disks, rings, or transverse strips or layers of elastic or non-elastic fibrous material, with india-rubber, or its equivalent, by cementing or vulcanizing the same in contact with such material, all substantially in the manner and for the purpose herein set forth.

57,601.—WASHING MACHINE.—Daniel T. Ward, Cardington, Ohio.

First, I claim the wash-board, F, constructed and arranged with reference to the vessel, A, substantially as described, and for the purposes specified.

Second, The combination of the wash-board, F, and the roller, B, substantially as and for the purpose described.

Third, The arms, S and T, roller, x, spring, u, when arranged in connection with the wash-board, F, and roller, B, substantially as and for the purpose specified.

59,602.—FLUID LENS.—Oscar Warden, Cincinnati, Ohio.

I claim the lamp, E, base, F, and reflector, T, connected and moving together, when used in combination with the guide ways, b, screw, G, segment bar, K, and plane convex fluid lens, A a, all constructed and operating as and for the purposes specified.

57,603.—WHIP SOCKET.—Theos. Weaver, Harrisburg, Pa. Antedated Aug. 13, 1866.

First, I claim the interposition of a rigid disk or disks between the inner walls of a whip socket tube, so as to lock in it the but of a whip stock, that it cannot be removed without the use of a key, or other equivalent instrument, substantially as herein described.

Second, The construction of the locking thimble, as shown in Figs. 2 and 3, with the crescent, B, springs, R R R, and keyhole, C; also the construction of the thimble chamber, as shown in Fig. 6, with the crescent, H, the notches, X X X X' X', and key guard, O, substantially as herein set forth.

Third, The combination and arrangement of the subjects of the second claim, when the thimble is so operated by the key, shown in Fig. 7, as partially to open or close the gibbous aperture of the tube, substantially in the manner and for the purpose as herein shown and explained.

57,604.—SEED DISTRIBUTOR.—M. D., E. C. and A. Wells, Morgantown, West Va.

We claim the box, A, constructed as described, the shaft. B, provided with the slot, a, or its equivalent, block, b, strip, d, and flanges, S S, the whole constructed, arranged, and operating substantially as herein set forth.

57,605.—GRAIN-HULLING MACHINE.—J. A. Welsh, Xenia, Ohio.

I claim the combination of the feeding tube, B, and the conical end or part, s, of the drum, d, or its equivalent, the amount fed in being regulated by a gate, b, substantially as and for the purpose herein specified.

I also claim the transferring cylinders, K L M, constructed and operating substantially as and for the purpose herein set forth.

I also claim the lining of connected sand, or its equivalent. secured to the grates, F F, substantially as and for the purpose herein specified.

57,606.—CHURN.—Isaiah M. West, Wilmington, Ohio.

I claim the combination of the dasher ring, A, and aperture, d d, whether conical or not, in the dasher boards, B B, substantially as and for the purpose herein specified.

57,607.—ORDNANCE AND FIRE-ARM.—Rollin White, Bridgeport, Conn.

I claim, First, The ring, F, of larger circumference than the projectile, applied in combination with the enlarged chamber, a a, to form a seat for the projectile, and to traverse in the enlarged chamber and carry the ball to the rear of the bore of the barrel, substantially as and for the purpose herein specified.

Second, Providing the accelerating chamber constructed in the barrel of a piece of ordnance or fire-arm with vents, m, opening into the barrel in front of the muzzle of the said chamber, substantially as and for the purpose herein specified.

57,608.—HORSE-POWER APPARATUS FOR ELEVATING HAY, ETC.—Frank Wicks, Upper Sandusky, Ohio.

I claim, in combination with the sweep and hoisting or rope wheel, a clutch, and a brake lever operating therewith, substantially in the manner and for the purpose described.

57,609.—HORSE HAY FORK.—Frank Wicks, Upper Sandusky, Ohio.

I claim, First, The hinged self-acting brace, F, for setting the fork and holding it in proper carrying position under its load, substantially as described.

I also claim the combination of the hinged ball, D, its shank, E, and the brace, F, pivoted to said shank, and carrying a roller, d, as and for the purpose substantially as herein described.

I also claim, in combination with the roller, d, in the brace, and the recess, c, in the shank, C, the pivoting of the trigger at a point behind and below said recess, so that when unrestrained it will swing out of the way, and allow the brace and its roller to find their proper setting positions, substantially as described.

I also claim, in combination with a trigger that is operated to throw the brace out of its place, by means of a cord passing over a pulley in rear of said seat, and arranged in the shank in rear thereof, the controlling devices, i i, for restricting the motion of the trigger on each side of its center of motion or pivot, substantially as described.

I also claim, in combination with the self-acting hinged brace, F, a permanent notch, stop, recess, or its equivalent, for the purpose of receiving and retaining the brace, thereby holding the fork in proper position while elevating its load, substantially as described.

57,610.—TACKLE BLOCK FOR HAY ELEVATORS.—Frank Wicks and F. F. Fowler, Upper Sandusky, Ohio.

We claim a hoisting block, the sheave of which is covered, where the rope runs in contact with it, with lead, or a composition of lead with other soft metals, for the purpose of coating or glazing an oiled rope when used therewith, and to prevent it from cutting, chafing, and wearing, substantially as described.

57,611.—STOPPINGS FOR HORSES' FEET.—Albert S. Wilkinson, Pawtucket, R. I.

First, I claim a sponge stopping, having a V-shaped recess, a, cut in its rear edge for receiving the frog of the foot, substantially in the manner and for the purpose specified.

Second, I claim an air-cushion stopping, B, substantially in the manner and for the purpose set forth.

Third, I claim an elastic pad stopping, C, of rubber constructed either solid or hollow, and secured in place by a web, D D, substantially in the manner and for the purpose set forth.

Fourth, I claim a heel flap, d, attached to a web covering the sole of the foot, constructed and operating substantially in the manner and for the purpose described.

57,612.—SAWING MACHINE.—George L. Wilcox, Hebron, Conn.

I claim the arrangement of the double dog piece, M. ratchet, N, handle, O, and springs, L and P, with the guide piece, J, when arranged for joint operation, substantially as described and for the purposes specified.

57,613.—STEAM TRAP.—Joseph Wilson, Manchester, N. H.

I claim the arrangement herein set forth whereby the valve may enter and traverse in its seat, sleeve or cylinder, and thereby prevent the straining, bending, or otherwise deranging some part of the apparatus.

And in combination with a valve arranged to enter and traverse in its seat or sleeve, I claim the rod which operates the valve, substantially as described.

57,614.—EXCAVATING MACHINE.—Caleb Winegar, Union Springs, N. Y.

I claim the hinged shovel, A, operated by means of the handle C, notched bar, B, and spring, D, not confining myself to the precise arrangement, but by equivalent means, substantially the same, to accomplish the same object.

57,615.—MACHINE FOR MANUFACTURING EAVES-TROUGHS.—Samuel Yates, Clarence, Iowa.

I claim the entire combination of the half oval bar, A, the bands, B, the spiral springs, C, and each and every part of the machine, which combination greatly facilitates the process of making tin spouting for houses, lessens the labor. and secures more perfect spouting when finished.

57,616.—DOOR BOLT.—George T. Allamby, Bangor, Me.

I claim the combination of the socketed arm, f, or its equivalent, with the bolt, A, applied to the case as explained, the separate knob, C, its shank, d, and the curved slot, b, made in the bolt case, the whole being arranged substantially in the manner and so as to operate as described.

I also claim the combination of the covering plate, c, the slot, b, the shank, d, the knob, C, and the socketed arm, f, as applied to the bolt and its case, the whole being arranged substantially in the manner and to operate as explained.

57,617.—MACHINE FOR MAKING ENVELOPES.—Edward Allen, Norwalk, Conn.

I claim, First, Arranging the following apparatus of an envelope machine to revolve about an upright axis, substantially as specified.

Second, The combination in an envelope machine of one or more sets of folding apparatus and stationary feed board or feed table, substantially as and for the purpose herein described.

Third, The combination in an envelope machine of one or more revolving plungers, a fixed feed table or feed board, and a die plate which moves a certain distance with the said plunger or plungers, and afterward returns to a fixed position relatively to the said feed board or feed table, substantially as and for the purpose herein described.

Fourth, The sliding pins, n and n', operating conjointly to deliver the envelopes from the folding apparatus, substantially as herein set forth.

Fifth, The nipping jaws, u' w', so arranged as to swing to and from the table, A, to remove the envelopes from the folding apparatus, substantially as herein set forth.

Sixth, The curved and inclined stationary cams, j' s u v, arranged in relation to the wings, c' d' e' f, of the folding apparatus, substantially as herein set forth for the purpose specified.

Seventh, The brake, f3, applied and operating in combination with the laterally moving die plate, H, substantially as herein set forth for the purpose specified.

Eighth, The arrangement of the pivoted bars, b3, and their pins, c3, with reference to the downwardly projecting pin, a3, and to the stationary cam, 3, to produce the lateral movement of the die plate, H, substantially as herein set forth.

Ninth, The nipping jaws, u' w', swinging on a vertical axis, and arranged with reference to the rotating cam, L, bar, e'', friction roller, f, and arm, N, substantially as herein set forth for the purpose specified.

Tenth, The spring, y', curved arm, x', and spring catch, b'', arranged with reference to each other and to the nipping jaws, u' w', projection, d', and stationary cam, K, substantially as herein set forth for the purpose specified.

57,618.—CAR COUPLING.—Cyrus W. Baldwin (assignor to himself, W. D. Richards, and W. E. Russell), Boston, Mass.

I claim the employment of the balanced lever, B, when made and applied substantially in the manner and to operate as before described.

I also claim, in combination with the said lever, B, the revolving block, C, and locking bar, D, substantially as set forth and explained.

I also claim the peculiar construction of the block, C, as made with the recess, d, shoulders, d1 d2, and notch, g', all as described.

57,619.—CULTIVATOR.—Jacob Bergen (assignor to himself and Peter Kaufman), Plain Township, Ohio.

First, I claim the peculiar arrangement of the bent axle, H G F G H, in connection with the frame, A, and the wheels, G, substantially in the manner and for the purpose specified.

Second, The peculiar arrangement of the back braces, E, and frame, A, in the manner and for the purpose specified.

57,620.—APPARATUS FOR TURNING SHAFTS.—John F. Bogardus (assignor to himself, Joseph Anderson, and T. K. Schermerhorn), Brooklyn, N. Y.

First, I claim the rings, c and d, divided and otherwise constructed and fitted together as described, in combination with worm wheel, f, or other equivalent means for imparting a movement of rotation to said ring, d.

Second, I claim the arrangement of the rests, k and l, and tools, i and o, with a rotating ring, substantially as described.

57,621.—PIPE WRENCH.—Amos Call (assignor to the Bemis & Call Hardware and Tool Co.), Springfield, Mass.

I claim the combination of the spring, F, with the parts H and E, of the wrench, when arranged and operating substantially in the manner and for the purpose herein described.

57,622.—REVOLVING FIRE-ARM.—Charles A. Converse and Samuel S. Hopkins (assignors to the Bacon Manufacturing Co.), Norwich, Conn.

We claim, First, The ring, D, encircling the pepper box, A, in front of its shoulder, g, in combination therewith and with screw, E, and bracket, G, arranged and operating in the manner and for the purpose herein represented and described.

Second, We also claim, in combination the base pin, F, about which the cylinder revolves, the ring, D, the many chambered cylinder, A, and the bracket, C, substantially as above shown.

57,623.—METHOD OF PROPELLING STREET CARS.—J. W. Conway (assignor to himself and Wm. Conway), Madison, Ind.

I claim the endless screw, I G, in combination with the driving or crank shaft, N, and the axle, D, of one pair of the wheels of a carriage or car, substantially as and for the purpose specified.

57,624.—STARTING CAR.—Henry H. Covert (assignor to himself and Smith R. Woolley), Detroit, Mich.

I claim the pinch bar or lever, D, one or more applied to a railroad car arranged in connection with a toggle, E, and bar, I, or

their equivalents, for the purpose of acting upon the wheel or wheels for the purpose of starting a car under the action of the team or other motor, substantially as described.

I further claim the draw bar, K, having a spring, M, upon it and provided with the projecting rod, N, passing through a slot in the box or case, L, in connection with the notch, c, in bar, I, substantially as and for the purpose set forth.

57,625.—Wagon Brake.—George W. Growe (assignor to himself and Benjamin Martin), Cincinnati, Ohio.

I claim an improved wagon brake, formed by combining the lever brake bars, D, and F, the connecting lever, I, connecting rod or bar, J, and the operating lever, K, with each other, the said parts being constructed and arranged substantially as herein described and for the purpose set forth.

57,626.—Roofing Cement.—Joseph Darby (assignor to himself and Stephen Brewer), Cortlandville, N. Y.

I claim an elastic cement or composition of matter composed of the aforesaid herein named ingredients, as and for the purposes herein set forth and described.

57,627.—Saw.—J. E. Emerson, Trenton, N. J., assignor to American Saw Company, New York City.

I claim the teeth, B, fitted at the back by tongue and groove joints, f g, to the shoulders, e, of the saw plate in combination with rivets, screws or keys, C, applied to the heels, c, of the teeth, when the parts are constructed and arranged substantially as herein represented, so that in inserting the teeth the shoulders, a, must be first placed in position, and the heels afterward introduced laterally to the saw plate and there secured by the rivets, C, as explained.

57,628.—Brick Machine.—Henry J. Ferguson, New York City, assignor to Selah Reeve, Brooklyn, N. Y.

I claim, First, The combination of the rotating disk, J, having a center cam, h, and outer eccentric or cam-shaped ring, i, with the pitman, I, to the plunger, H, and slide, K, to the pitman, L, for operating the plunger and pusher, substantially as described.

Second, The combination of the disk, J, with its radial slide, f, pitman, I, and plunger, H, adjustably connected as described through a slot in the standard, c, by keys, d, fitting in key ways or grooves, e, as herein set forth.

Third, The slotted levers, R S, pivoted together by joint pins, p, fast and loose collars, q r, bosses, s, and lock nuts, t, substantially as specified.

Fourth, The combination of the pitman, L, with the arm, P, on the rock shaft, Q, geared together by a joint pin, u, arranged to fit in a notch at the back of the pitman and held in gear therewith by a catch, w, and spring, z, essentially as and for the purpose or purposes herein set forth.

57,629.—Breast Strap Hook.—Henry Foulkes, Utica, N. Y., assignor to John H. Chapman.

I claim the securing or closing the opening of the hook by the use of a screw in the manner substantially as described.

57,630.—Hydraulic Governor.—James E. Gillespie (assignor to Gillespie Governor Company), Boston, Mass.

I claim the combination of a governing device with the cylinder, d, its piston, f, and the spring, n, or the equivalents of these, when arranged to operate together, substantially as specified.

Also, in combination with the foregoing of a passage capable of variation, when so arranged as that by such variation the rate of speed of the movement of the piston, under influence of its spring, may be changed.

Also, combining a governor and the object governed thereby, in such a manner that, while the connection between the governor and the governed object can be broken to prevent movement of the latter in one direction, the connection causing movement of the governed object in the reverse direction remains operative, substantially as shown and described.

57,631.—Machine for Bending Horseshoes.—William F. Goulding, Providence, R. I., assignor to The Goodenough Horseshoe Company, New York City.

I claim, First, The revolving flat bed or table, B, provided with suitable forming blocks, G, and guides, b b, in combination with suitable stationary bending instruments, F F, arranged substantially as described, for the purposes specified.

Second, The combination of the stationary finger, H, with the forming block, G, and the said revolving bed, B, arranged substantially as described, for the purposes specified.

57,632.—Buckle.—Henry C. Griggs (assignor to Smith & Griggs), Waterbury, Conn.

I claim the combination of the frame part with the tongue part, when they are constructed, connected, and fitted to operate, substantially as herein described and set forth.

57,633.—Life Boat.—Henry Hensel (assignor to Louis Sulter), Carver, Minn.

I claim the air chambers, G and H, surrounding the self-adjusting cylinder boat, A, operating independently on the center shaft, J, arranged and combined with end propellers, K, for the purpose of steering and turning the boat quickly, at the same time preventing the boat from sinking, giving the greatest safety to the passengers as a buoyant life boat.

57,634.—Printing Press.—George J. Hill, Buffalo, N. Y., and Stephen Greene, Philadelphia, Pa., assignors to Stephen Greene and H. G. Leisenning, Philadelphia, Pa.

We claim, First, The vibrating cam levers, constructed and arranged for the operating of a guided cross-head, D, substantially as herein set forth.

Second, The guides, M M', composed of plates constructed and arranged for vertical self-adjustability to suit cards differing in thickness and for the retention and guidance of the cards, substantially as set forth.

Third, The combination of the said guides, M M', with the ticket or card box, N.

Fourth, The movable receiving box, N', where the vertical position of the same is controlled by the quantity of cards in the box, N, through the medium of the devices herein described or any equivalent to the same for the purpose specified.

57,635.—Pump.—Edward B. Juckett, Roxbury, Mass., assignor to himself and Hunneman & Co.

I claim my improved double acting force pump, or peculiar arrangement of the valve chambers, D D G, the induction chambers or passages, E F, and the pump barrel, A, as described, such valve or chambers to be provided with valves, and valve openings, and such barrel to have a piston to operate as specified.

57,636.—Magazine Fire-arm.—Nelson King, Bridgeport, Conn., assignor to O. F. Winchester.

I claim the arrangement of the retracting hook, a2, with its sleeve, d2, upon the breech pin, L, so as to retract the cartridge or shell, substantially in the manner herein described.

57,637.—Steam Generator.—Charles Kinkel, New York City, assignor to Charles Wehle, Hoboken, N. J.

I claim the new method herein described for preventing explosions of steam boilers, by a combination of a steam boiler with the mechanism, substantially as described, which keeps the water in the boiler in constant and regular motion.

57,638.—Hat-pressing Machine.—Monroe Morse (assignor to himself and Aaron H. Morse), Franklin, Mass.

I claim the combination as well as the arrangement of a solid elastic presser with the mold, its head, and mechanism for expanding such presser by pressure against it, substantially as specified.

I also claim the application of the head, C, to the mold by means of centers, as described, so that such head, while being withdrawn from the mold, shall be brought into an inclined position in order to facilitate the application of a hat to the presser.

I also claim the combination of the bar, G, the slides, I I, and their pins, with the toggles or progressive levers, o p q q r, and the foot lever, s.

I also claim the combination and arrangement of bolts, w w, catches, v v, and levers, y y, applied to the mold and the vibrating head, as described.

I also claim the combination of the adjusting screw, g, and its nuts, I I, with the bar, G, the vibrating head, C, and disk, E, and presser, D.

57,639.—Apparatus for Carbureting Air.—James F. Rowley, William M. Sloane, and James E. Woodruff, Buffalo, N. Y., assignors to themselves and John D. Cross.

We claim an apparatus for carbureting air or gas, having a reservoir, B, for hydro carbon, a lime chamber, D, and chambers, E and F, containing porous substance, all arranged and constructed in the manner and for the purpose substantially as herein set forth.

57,640.—Platform Scale.—Elnathan Sampson, Lansingburgh, N. Y., assignor to Alfred Clark Hitchcock, Troy, N. Y.

First, I claim the location, under the platform of a scale, of a series of bell crank levers, E, with yokes, F, and suspension links, c c, which connect said yokes with co-operating and connecting parts for supporting the platform of the scale, substantially as herein described and for the purpose set forth.

Second, I claim the arrangement of a series of bell crank levers with their long arms in upright position below, and placed transversely to the length of the platform, or to the trackway over the platform of the scale, substantially in the manner as herein described, and for the purpose set forth.

Third, When arranged in combination with the lever, E, with the yoke, F, fulcrum standard, D, and platform timbers, B B, I claim the supporting plate or frame, J, or its equivalent device, constructed and arranged substantially in the manner and for the purpose as herein set forth.

Fourth, I claim the arrangement, relatively to and with each other, and with the platform timbers, of the respective bell crank levers with yokes, supporting plates or frames, and fulcrum standards, as herein described, when the same are so connected with each other by connecting parts as to operate together for the purpose of a platform scale, substantially in the manner as herein described.

57,641.—Weigh-lock Scale.—Elnathan Sampson, Lansingburgh, N. Y., assignor to Alfred Clark Hitchcock, Troy, N. Y.

First, I claim the combination of the bell crank lever, F, and the direct sustaining levers, C and C', when said sustaining levers are arranged in horizontal parallel positions to the side walls of the lock chamber, substantially as described, and for the purposes as set forth.

Second, Arranged in connection with the bell crank levers, F F, in manner as described, I claim the combination of the bell crank levers, c c', and transmitting lever, i, substantially as and for the purpose herein set forth.

Third, I claim connecting the devices arranged on opposite sides of the lock chamber, and constituting a weighing apparatus for weigh-lock scales, by arranging the mechanical means employed for that purpose under the floor of the lock chamber, in manner substantially as herein described, and for the objects as set forth.

Fourth, Arranged and connected with the bell crank levers, F F, in manner as described, I claim the combination of the bell crank levers, t t', with the bell crank connecting lever, s', for the purpose of transmitting the weight of the vessel resting upon the cradle, to the scale beam, in manner substantially as herein described.

Fifth, In combination with the bell crank levers, c c', and transmitting lever, i, the manner herein described of connecting the weighing apparatus of the opposite sides of the lock chamber, and the bell crank levers, t t' and s, all arranged with reference to each other, substantially as herein set forth, I claim the arrangement of the said direct sustaining levers, for the purpose of a weight-lock scale, in manner substantially as herein described.

57,642.—Ventilated Larder.—John Sloan (assignor to himself and John W. Jones), Philadelphia, Pa.

I claim the combination of box, A A, air pipe, K K, and discharge pipe, K' K', charcoal box, A A', with larder, F F, in the manner as herein described, or any other, and substantially the same, so as to obtain the desired and intended effect.

57,643.—Steam-generating Apparatus.—Scott A. Smith (assignor to himself, G. V. Cresson, and George W. Hubbard), Philadelphia, Pa.

I claim the method substantially as described, of constructing a steam generating apparatus by combining a series of annular generating vessels with a bottom connecting reservoir.

57,644.—Machine for Making Cast-steel Castings.—John Blake Tarr (assignor to himself and P. E. Merrihew), Chicago, Ill.

I claim, First, subjecting the cast-steel, while in a liquid state, and within the mold which is to give it the desired form, to such a degree of pressure as will cause the expulsion of air and gas from it and render it more solid, by means substantially as described.

Second, Constructing the bottom of the mold at those points which are directly under the ingates, of adjustable blocks of plumbago, or other analogous substance, substantially in the manner and for the purpose described.

Third, The manner, substantially as herein described, of constructing the ingates with cutters on them, when said ingates are applied and operated as described for the purpose set forth.

Fourth, The use of adjusting screws in conjunction with mold sections, A B C, and the hooks, g h, or their equivalents, substantially as described.

57,645.—Safety Watch Pocket.—T. W. Terry (assignor to himself and Geo. W. Hoff), Baltimore, Md.

I claim the combination of the plates, A B, hinged staple, c, and button, e, constructed and operating substantially as and for the purpose described.

57,646.—Temple for Loom.—George L. White, Cumberland, R. I., assignor to W. W. Dutcher & Co., Milford, Mass.

I claim the combination of the tooth, g, and the notch, f, or their mechanical equivalent or equivalents, with the temple, its arm, D, spring, F, and frame, E, the said tooth and notch being for the purpose hereinbefore explained.

57,647.—Operating India-rubber Springs.—J. W. Wilder (assignor to himself and Ebenezer Butterick), New York City.

I claim the protecting case, B, and plunger, C, in combination with a piece of india-rubber, A, substantially as and for the purpose described.

57,648.—Piston for Steam Engine.—Geo. Brower, Ashton under Lyne, England, and John Quatter, Barnsley, Eng.

We claim, in combination with springs composed of a series of plates, the wedges, e, and wedge pieces, d', combined, and arranged to operate in the manner and for the purpose substantially as herein described.

57,649.—Bleaching Animal and Vegetable Fibers.—C. M. E. du Motay and C. R. Marechal, Metz, France.

We claim, First, the method of bleaching vegetable and animal fibers and tissues by the employment of manganates, permanganates, and permanganic acid, substantially as herein described.

Second, The method of producing the said manganates and permanganates, substantially as herein shown and described.

57,650.—Lumber Wagon.—C. F. Hall, Toronto, Canada West.

I claim the roller, A, with perforated projecting ends, the perforated plate, E, in combination with the boxes, B, of the running gear of wagon, provided at its forward end with rollers, G, and bearings, H, all constructed and operating substantially as described for the purpose specified.

57,651.—Mode of Producing Etching Grounds.—R. Gottgetreu, Munich, Bavaria, assignor to Lennetg & Clemm, Philadelphia, Pa.

First, I claim the entire process, as above, preparatory to etching the design or designs on plates or surfaces of any description, said designs being procured by crystallization of solutions.

Second, I claim the process of using crystallizing solutions for the production of images on surfaces that can be etched, in the usual method of engravers.

57,652.—Steam Plow.—John Fowler, Jr., Cornhill, England, Wm. Worby, Ipswitch, Eng., and David Greig, New Cross, Eng., assignors to Wm. P. Tatham, Philadelphia, Pa.

We claim, in machinery for actuating agricultural implements by steam power, combining the two drums, which alternately wind up and let off the rope by which the agricultural implement is drawn, with the driving shaft of the steam engine, or equivalent motor, by means of the cogged or toothed wheels on the drums, the two sets of pinions on the driving shaft, and the clutches and friction straps, or the equivalents thereof, substantially as and for the purpose specified.

57,653.—Steam Plow.—Robert Fowler, London, Eng., and Robt. Wm. Eddison, Leeds, Eng., Executors of John Fowler, Jr., David Greig, and Richard Noddings, Leeds, Eng., assignors to William P. Tatham, Philadelphia, Pa.

We claim, in guiding the laying of the rope on to the periphery of the drum, in machinery for drawing agricultural implements by steam power, combining the guiding lever for guiding the rope with the flanched drum for drawing and winding the rope by means of the cam and differential wheels, substantially as described and for the purpose specified.

We also claim connecting the guiding lever with the winding drum, so that in addition to having an up and down motion to lay the rope properly on the face of the drum, its guiding end shall be free to revolve around the drum, and thus adapt itself to the angle at which the rope may be hauling, substantially as described.

57,654.—Burglar Alarm and Door Fastener.—Frederick Oakley, London, Eng., assignor to John Collins, New York City.

I claim, First, The revolving eccentric block, k, with pins, l, attached to it, in the manner and for the purpose herein shown and described.

Second, The combination of the barrel or powder chamber, f, with the set screw, g, nipple, e, and bars, A and B, substantially as herein shown and described.

57,655.—Method of Tempering Knife Sections for Harvesters, etc.—Asa R. Reynolds, Auburn, N. Y.

First, I claim hard tempering the edges of steel blades or sections by means of a blow from a hammer or drop press delivered under conditions and with a reaction, substantially such as herein described.

Second, I claim supporting the blade, section, or blank, to be hard tempered by a drop die or hammer, upon or by its edges, upon an under die, having inclined or sloping faces, substantially as herein described.

Third, I claim means for forcing or directing a blast of air upon that portion of the blade which is not to be highly tempered, when used in connection with a hammer or drop press conditioned for giving a blow and for reaction, substantially as herein described.

REISSUES.

2,342.—Gas-pipe Joint.—Henry L. Case (Administrator of the Estate of Richard C. Robbins, deceased), Henry L. Case, and Jesse M. Keen, Jersey City, N. J., and John W. Mason, Brooklyn, N. Y., assignees of said Richard C. Robbins, deceased. Patented Jan. 13, 1863.

Claims a joint for gas and other similar pipes, constructed in the manner herein above described, that is to say, the socket end of a length or section of pipe, having a groove formed in it capable of retaining the packing in three directions, as set forth, a packing ring of soft metal being cast into the said groove; and the plug end or entering end of the adjoining length or section of pipe being made conical and driven into the packing, substantially as hereinbefore described; and the said joint being composed of three parts only, as set forth.

2,343.—Pump.—William D. Hooker, San Francisco, Cal. Patented Aug. 15, 1865.

I claim a vertical and inclined partition, h, in combination with the suction valve seats, c1 c2, and discharge valve seats, d1 and d2, and the valves, a1 a2 b1 b2, the whole arranged as described and for the purpose specified.

2,344.—Metallic Shield for Breast Straps.—Martin W. Pond and Henry E. Mussey, Elyria, Ohio, assignors to Martin W. Pond. Patented Sept. 6, 1864.

We claim, First, The seat, f, and base of horns, d d, the same being constructed and operating in the manner and for the purposes substantially as specified.

Second, The curved metallic slide, having curved metallic horns, as described, in combination with the projections or base of horns forming the clamping seat, f, of the shield, the whole being constructed in the manner and for the purpose described.

2,345.—Bag Frame.—Albert J. Sessions, Bristol, Conn. Patented June 12, 1866.

I claim slitting or punching the strip, substantially as described, so as to form the side and rim of the corner or corners of a frame in one piece of metal.

I also claim forming the inside corners square at a, substantially as described.

Third, Forming the inside corners of a bag frame square, while the outside corners are flattened, curved, or rounded, by means substantially as described.

2,346.—Refrigerator.—Peter A. Vogt, Buffalo, N. Y. Patented May 22, 1866.

I claim the door, D, constructed as described, combined and arranged with the rack, f f, of the ice compartment, so as to turn down and form a platform in continuation thereof, for introducing and removing ice from the chamber, B, substantially in the manner specified.

I also claim the arrangement of the induction air passage through the drip pipe, l, and extension pipe, m, in combination with the trap, k, or its equivalent, whereby the air entering is carried to the top of the ice chamber and cooled in its passage, substantially as set forth.

Receipts.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of the reception of their funds.

THE MARKETS.

The fall trade has not yet fairly commenced. Money is plenty, and the recent disbursements from the Treasury, and the influx of specie from Europe, serve to encourage speculation, which, however, is checked by the continuance of full prices and the lessened demand for exports. Business generally is gradually reviving, and there is a fair show for a steady and increasing demand for most of our staple productions. The prospects of the money market are fair, and the increased demand for our Government securities abroad encouraging.

GOLD—At last quotations. Money is obtained on call at 4@5 ₱ cent. Discount at about 6 ₱ cent.

ASHES—Pots are quite dull, but with continued light receipts, market steady. Pearls are nominal.

BRICKS—Common Hard, $12@13. Croton and Philadelphia are unchanged at $14@$15 for the former, and $40 for the latter.

COFFEE—Slight advances for lower grades of Rio.

COPPER—Detroit, 31@31½; Portage Lake, 31.

COTTON—Prices unchanged, although the demand is more brisk. Ordinary, 25@28; middling, 33@37c.

FLOUR—Slight advance. Common brands, $8 55@$9 85; Genesee extra, $10 25@$12 50; Canada not in demand.

GRAIN—Wheat advanced slightly. Milwaukee, $2 25@$2 37 Amber, $2 75; North Carolina Red, $2 86. No exports. Rye, Western, 81c; Corn, declined 1½ cents. Oats 30@44 Chicago; 45@47 Milwaukee; 57 Delaware.

IRON—Market dull. No. 1 American pig $47@$48. Scotch, $47@$50. Bar and scrap very quiet.

LATHS—Are firm, with sales of Eastern at $4, three months.

LEAD—Pig is steady, with a fair demand; sales about 400 tons ordinary Foreign at 6¾@7 cents gold. Bar is steady at $10 50, and Sheet and Pipe $10 70 ₱ 100 lb net cash.

LEATHER—The market for Hemlock Sole continues dull, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33@34 cents; Middle do., 35@36; Heavy do., 36@37; California Light, 31@32; Middle do., 33½@34½; Heavy do., 34@35; Orinoco, &c., Light, 31@32; Middle do., 33@34; Heavy do., 29@32; Slaughter Upper in Rough, 31@33. Oak Sole is in light stock, and the market is firm. French and American Calf Skins are firm with a fair demand.

LIME—No transactions. Rosendal Cement, $1 75, cash.

LUMBER—Eastern Spruce lower, with sales at $22@22 50.

MOLASSES—The market continues dull, and is still weaker than before, prices ruling in favor of buyers. The sales are 273 hhds. and 28 tcs. Porto Rico, and 287 hhds. English Islands, on terms not made public; 20 Guadalupe, 55cts.; 50 hhds. and 1 bbl. Cuba Muscovado, 51; 33 hhds. Clayed do., 45; and 50 bbls. Texas 30, four months. By auction, 200 bbls. New Orleans sold at 65cts; and 10 hhds. Porto Rico, 67, cash. The stock is about 5,750 hhds. Porto Rico, 6,200 Cuba, etc., and 100 bbls. New Orleans.

NAILS—Cut are very firm and scarce, with a tendency to advance; some sizes are scarce, and for these ¼ cent more is paid. We quote: Cut, 6¾@7 cents; Clinch, 8¼; Forged Horse, 32 Pressed do., 22@24; Copper, 50; Yellow Metal, 33; Zinc, 20; and Wrought Ship and Boat Spikes, 7@8 cents, as to sizes, net cash.

SUGAR—Prices have favored buyers, and we have to notice an advance of ⅛ of a cent ₱ lb on Refining grades, bringing Fair Refining Cuba to 10¾@11 cents; Good, do., to 11@11⅛; and No. 12 Box to 11⅜@11¾, 4 mos. Grocery grades are without particular change, but are the turn dearer. Refined continues in good demand, but is less active than before. Messrs. Stuart quote their best Crushed, Granulated, and Ground, 16 cents; White A, 15⅝; and Yellow C, 15¼.

WIRE—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 18 covered, and 35c. for uncovered.

WOOL—Market unsettled. Western Fleeces at 48@50c. for low grades, 55 for ordinary, and 65@72½ for choice—the latter price for Ohio picklock; super and extra pulled, 53@65; short staple at 35; Texas, 15@18 for inferior, 20@24 for ordinary, and 25@30 for superior.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

PATENT OFFICE.

PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *twenty years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after so many years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office.

Judge Mason, formerly Commissioner of Patents, says, in a letter addressed to us:—"In all your intercourse with the Office, I always observed a marked degree of promptness, *skill*, and fidelity to the interests of your clients."

Ex-Commissioner Holt says:—"Your business was *very large*, and you sustained and justly deserved the reputation of *marked ability* and *uncompromising fidelity* to the interests of your clients."

Ex-Commissioner Bishop says:—"I have ever found you faithful and devoted to the interests of your clients, as well as *eminently qualified* to perform the duties of Patent Attorneys."

EXAMINATIONS.—If an Inventor wishes our opinion in regard to the probable novelty of his invention, he has only to send us a pencil or pen-and-ink sketch of it, together with a description of its operation. For an Opinion, without examination at the Patent Office, we make no charge, but if a

PRELIMINARY EXAMINATION AT THE PATENT OFFICE

is desired, we charge the small fee of $5. This examination involves a personal search at the Patent Office of all models belonging to the class, and will generally determine the question of novelty in advance of an application for a patent. Up to this time we have conducted over TWELVE THOUSAND Preliminary Examinations, thus showing a more intimate knowledge of inventions at the Patent Office than can be possessed by any other person or firm.

If an inventor decides to apply for a patent, he should proceed at once to send us, by express (charges prepaid) a model not over one foot in size, and substantially made. He should also attach his name and residence to the model.

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

On filing each Cavat	$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 Canadians have to pay $500.

FOREIGN PATENTS.—Messrs. MUNN & CO. have had more experience than any other solicitors in this country in procuring foreign patents, and have old-established agencies in London, Paris Brussels, Berlin, Vienna, and other large cities. Foreign business should never be intrusted to other than experienced agents.

If an inventor wishes to apply for a patent, all he has to do is to write to us freely for advice and instruction, and he will receive prompt attention. If his invention contains any patentable features, he can depend upon getting his Letters Patent. All communications considered confidential. Send models and fees addressed to

MUNN & CO.,
No. 37 Park Row, New York

NEW RATES OF ADVERTISING:

FORTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

OBSERVE.—A PERSON EXPERIENCED IN running light machinery and making tempering dies, wishes a situation. Willing to go into the country. Address J. W. C.
11 2*] Brooklyn Post-office, Brooklyn, N. Y.

DISTINGUISHED CHARACTERS.—THE ILlustrated Phrenological Journal for September contains portraits, with descriptions, of Count Bismark, of Prussia; Archduke Albert, of Austria; Queen Emma, of the Sandwich Islands; Joseph Sturge, of England; Horace Vernet, of France; F. N. Gisborn, of Newfoundland; Cyrus W. Field, of New York; and a Group of Native Africans, with articles on Anthropology, Physiology, Psychology, Pneumatology and Physiognomy; Characters in Shakspeare, Hamlet, Cassius, etc. Beaming Eyes, Impressions, Large Noses, Prenatal Influences, Sins of Society, Whom to Elect, Questions for Debating Societies, Phrenology, by John Neal; "Out of Place," by Mrs. Wyllis; Truth and Error, "Quack Medicines," Fagging and Flogging, Female Suffrage, Foreign Arts, etc. A rich number. 20 cents, or $2 a year. FOWLER & WELLS,
11 2] New York.

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. [11

FOR SALE CHEAP.—ONE GEAR CUTTER, one small Steam Engine (of about three horse), without boiler. Can be seen at our office. KEEN BROTHERS,
11 2] Room 2, 218 Fulton street.

GOVERNMENT AND CITY STANDARD STEAM GAGES.—Parties wishing to purchase a cheap and reliable Steam Gage, are requested to give us a call. All gages used in this city or on steamboats belonging to or tested in this port must conform to our standard. Marine Clocks, Registers, Whistles, Water Gages, etc., constantly on hand. Orders promptly attended to. Old gages repaired at short notice. KEEN BROTHERS, Room 2, 218 Fulton street. [11 4

LOCHMAN'S LIQUOR-SAVING TUNNEL—A perfect instrument. Patented February 7, 1865, and August 21, 1866. See Scientific American, June 17, 1865. Half interest or State rights for sale. Address C. L. LOCHMAN,
11] Carlisle, Pa.

SMYTH'S PATENT "SELF-ACTING BRAKE,"—For wagons, street cars, hoisting machines, etc.; is especially suited for the above kind of machines, or anywhere that a brake can be used; is simple, strong, and entirely "self-acting." State and County rights for sale low. Address C. A. SMYTH,
11] Box 223, Charleston, Ill.

CARD.—PROFESSOR H. DUSSAUCE, CHEMist, is ready to furnish to manufacturers the most recent European processes, as he will return in a few weeks. Those of his numerous friends who wish to transact some business in Europe could address 13 Avenue Bugeaurd, Paris, France. [11

$1,500 PER YEAR, PAID BY SHAW & CLARK, Biddeford, Me., or Chicago, Ill. [11

$150 A MONTH; NEW BUSINESS FOR Agents. H. B. SHAW, Alfred, Me. [11

WANTED—PRACTICAL WORKMEN OF Gold, Silver, and Steel Spectacles. Also the address of Manufacturers of Tools and Machinery used in the making of Spectacles. Apply, by letter, to L. BLACK & CO., Detroit, Mich. [11 1

WANTED A MOLDING MACHINE, AN out of wind Planer, and Scroll Saw. Address Box No. 343, Portland, Me., stating price, etc. [11 1

AMERICAN AGENCY IN PARIS.
The undersigned is prepared to attend to the reception, exhibition, or sale of any articles intended for the French Exposition of 1867.
Fifteen years' experience in the Banking and Commission business at Paris (embracing the period of the Exhibition of 1855) with a thorough knowledge of the French language and customs, will enable him to facilitate the wishes and promote the interests of exhibitors.
He refers, by permission, in New York, to W. H. Aspinwall, Esq., No. 33 University Place; W. H. Webb, Esq., No. 200 Lewis street; J. C. Derby, Esq., No. 5 Spruce street; W. H. Macy, Esq., President Leather Manufacturers' Bank; Messrs. Munn & Co., SCIENTIFIC AMERICAN; Messrs. W. A. & A. M. White, No. 63 Broadway.
11] JAMES W. TUCKER,
No. 13 Faubourg Montmartre, Paris.

PITTSBURGH LEAD PIPE AND SHEET LEAD WORKS make to order and keep on hand all sizes, lengths, and thicknesses of Lead Pipe and Sheet Lead at the lowest market rates. Also, Plumbers' Materials, Brass and Iron Cocks, Steam Gages, Steam Pumps, and Plain and Galvanized Iron Pipe. BAILEY, FARRELL & CO.,
11 1] 167 Smithfield street, Pittsburgh, Pa.

BAIRD'S PRACTICAL AND SCIENTIFIC Books.

LIST NO. 5.

Easton. A Practical Treatise on Street or Horse-power Railways; their Location, Construction, and Management; with general Plans and Rules for their Organization and Operation; together with Examinations as to their Advantages over the Omnibus System, and Inquiries as to their Value for Investment; including Copies of Municipal Ordinances relating thereto. By Alexander Easton, C. E. Illustrated by 23 plates. 8vo. cloth.....$2 00

Erni. Coal Oil and Petroleum: Their Origin, History, Geology, and Chemistry; with a view of their importance in their bearing on National Industry. By Dr. Henri Erni, Chief Chemist, Department of Agriculture. 12mo.....$2 50

Fisher's Photogenic Manipulation: 16mo. cloth, 62c.

Gilbart. A Practical Treatise on Banking. By James William Gilbart, F.R.S. A new, enlarged and improved edition. Edited by J. Smith Homans, editor of "Banker's Magazine." To which is added "Money," by H. C. Carey, 8vo.....$3 50

Gregory's Mathematics for Practical Men; adapted to the Pursuits of Surveyors, Architects, Mechanics, and Civil Engineers. 8vo., plates, cloth.....$2 50

Gas and Ventilation. A Practical Treatise on Gas and Ventilation. By E. E. Perkins. 12mo., cloth.....$1 25

Griswold. Railroad Engineer's Pocket Companion for the Field. By W. Griswold. 12mo., tucks.....$1 25

Inventor's Guide: Patent Office and Patent Laws; or, a Guide to Inventors, and a Book of Reference for Judges, Lawyers, Magistrates, and others. By J. G. Moore. 12mo., cloth.....$1 25

Jervis. Railway Property. A Treatise on the Construction and Management of Railways; designed to afford useful knowledge, in the popular style, to the holders of this class of Property; as well as Railway Managers, Officers, and Agents. By John B. Jervis, late Chief Engineer of the Hudson River Railroad, Croton Aqueduct, etc. One volume, 12mo., cloth.....$2 00

CONTENTS.—Preface, Introduction. Construction.—Introductory: Land and Land Damages; Location of Line; Method of Business; Grading; Bridges and Culverts; Road Crossings; Ballasting Track; Cross Sleepers; Chairs and Spikes; Rails; Station Buildings; Locomotives; Coaches and Cars. Operating.—Introductory: Freight; Passengers; Engine Drivers; Repairs to Track; Repairs of Machinery; Civil Engineer; Superintendent; Supplies of Material; Receipts; Disbursements; Statistics; Running Trains; Competition; Financial Management; General Remarks.

Johnson. A Report to the Navy Department of the United States on American Coals, applicable to Steam Navigation, and to other purposes. By Walter R. Johnson. With numerous illustrations. 607 pp. 8vo., half morocco.....$6 00

Johnson. The Coal Trade of British America: With Researches on the Characters and Practical Values of American and Foreign Coals. By Walter R. Johnson, Civil and Mining Engineer and Chemist. 8vo.....$2 00

☞ These important volumes of Prof. Johnson, now becoming scarce, contain the results of the experiments made for the Navy Department, upon which their coal contracts are at present based.

Johnston. Instructions for the Analysis of Soils, Limestones, and Manures. By J. F. W. Johnston. 12mo....38c.

☞ The above, or any of my publications sent by mail free of postage, at publication price. My new Catalogue of Practical and Scientific Books, sent free of postage to any one who will favor me with his address.

HENRY CAREY BAIRD,
Industrial Publisher,
No. 406 Walnut street, Philadelphia.

THE RIGHT TO MANUFACTURE THE HAMILTON HEAD BLOCKS FOR CIRCULAR SAW MILLS, owned and thus far exclusively used by the undersigned, will be disposed of in certain localities upon reasonable terms. It has proven its superiority over all others where it is known. They are in successful operation upon nearly 400 mills.
For information, address us at
HAMILTON, OHIO.
OWENS, LANE, DYER & CO.,
Manufacturers of
11 4*] THE ELLIPSE SAW MILLS.

WANTED—A TURBINE WHEEL, 60 to 100 horse-power. Builders will please address, with circulars, stating price, complete delivered in New York, JOHN H. HALL, President, Fayetteville, North Carolina. [11 2*

PARTNER WANTED TO TAKE ONE-HALF Interest in Secore's Horse Hay Fork, best in use. Rights for sale. Address [11 2*] C. L. BELLAMY, Hempstead, N. Y.

PLANER WANTED.—WANTED IMMEDIately a Planer or Shaper, suitable for shaping steel dies, to take in a piece 12 to 20 inches long and 10 to 18 inches in depth and width. Must be stiff and strong, and capable of taking a smooth heavy cut. Send description and price.
LEWIS, OLIVER & PHILLIPS,
11 3] Pittsburgh, Pa.

A CARD.—TO MECHANICS AND MANUfacturers.—The Chelsea Machine Works of Norwich, Conn., have on hand and are manufacturing Engine Lathes of very superior quality, with Smith's Patent Feed, and Cross-feed, and many other valuable improvements, making them the most desirable tool of its kind in market. The attention of Watchmakers and others is called to our small class of Engine Lathes as being extremely accurate and reliable; also, hand, drill, wood turning, and foot lathes; dial plates for gear cutters, and first-class machinery made to order, gear cutting, pattern making, iron forging, and general machine jobbing. Lathes fitted with scroll chucks when ordered. H. K. SMITH,
11] General Agent and Superintendent.

WANTED—MECHANICAL DRAFTSMAN, Expert at Isometric, Perspective, and Engrossing. Address G. H. KNIGHT, Lock Box 541, Cincinnati, Ohio. [11

BROUGHTON'S OILERS! DOUBLE-BOTTOM Seamless Bottom, Double-Acting and Engineer's Oilers, to be had at all first-class Hardware stores.
BROUGHTON & MOORE, Manufacturers, 41 Center st.

BROUGHTON'S Compression GAGE COCKS!
BROUGHTON'S GRADUATING LUBRICATORS!!
BROUGHTON'S TRANSPARENT OIL CUPS!
All warranted to be more simple in construction, easier to manage and keep in order, more economical, durable and effective than any others in the market. Send for illustrated catalogue to
11] BROUGHTON & MOORE, 41 Center st.

A MESSIEURS LES INVENTEURS—AVIS Important. Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communication seront reçues en confidence.
MUNN & CO.,
Scientific American Office, No. 37 Park Row, New York.

FOR WHEEL, FELLY AND SPOKE MAchinery, Spoke Lathes, Hub Mortising and Boring Machinery, Etc., address J. A. FAY, & Co., Cincinnati, Ohio. 51t6

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins' Air Pumps, Shafting, Pulleys, Gearing Pumps, and General Jobbing. Orders promptly filled for any kind of Machinery. JAMES A. ROBINSON, 161 Duane street, cor Hudson, New York. 1 tf

INCRUSTATIONS IN STEAM BOILERS.—Temple's Liquid removes and prevents Scale from forming Prevents Corrosion of the Iron. Price reduced. Address A. TEMPLE, Bridgeport, Conn.
26 12*

LUMBER CAN BE SEASONED IN FROM Two to Four days, by Bulkley's Patent, at an average cost of $1 per M. from the green. For Circular or information, address C. H. BULKLEY, No. 2 Case Building, Cleveland, Ohio.
4 8*]

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machine, address J. A. FAY & Co., Cincinnati, O. 3 1y

MILL-STONE DRESSING DIAMONDS SET in Patent Protector and Guide. Sold by JOHN DICKINSON, Patentee and Sole Manufacturer, and Importer of Diamonds, for all mechanical purposes; also, Manufacturer of Glaziers' Diamonds, No. 64 Nassau street, New York City. Old diamonds reset. N. B.—Send postage stamp for descriptive circular of the Dresser. 6 12*

SETS, VOLUMES AND NUMBERS.
Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New Series) can be supplied by addressing A. B. C., Box No. 773, care of MUNN & CO., New York

JUST PUBLISHED—THE INVENTOR'S AND MECHANIC'S GUIDE.—A new book upon Mechanics, Patents, and New Inventions. Containing the U. S. Patent Laws, Rules and Directions for doing business at the Patent Office; 112 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to sell Patents; Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues, Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO. 37 Park Row, N. Y. 15tf

WHEELER & WILSON, 625 BROADWAY, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1t

TO WRENCH MAKERS.—FOR SALE UPON Reasonable Terms, a valuable patent on a Pipe-Wrench Address, [26 tf] A. B., New York City, Box 773.

ONONDAGA STEEL WORKS.
ESTABLISHED 1863.
We can furnish from our Stock nearly all Sizes of Square, Flat, Octagon, or Round Tool Steel, from ¼ to 4 inches, of Superior Quality. Warranted equal to any imported or produced in this country. SWEET, BARNES & CO., Syracuse, N. Y.
New York House,
3 13* GILCHRIST, PIES & SHIPMAN, 40 Broad street.

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular.
J. E. BUERK.
26 18*] P. O. Box 1,057, Boston, Mass.

IMPORTANT TO MANUFACTURERS AND Inventors.—SMITH & GARVIN, No. 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of Light Machinery, Manufacturers' Tools, Models, etc. Satisfactory reference given. 6 28*

IMPORTANT TO MANUFACTURERS USING STEAM FOR POWER.
KELLEY & LAMB'S Improved Steam Engine Governor, the only Governor that will give the same speed, with high or low pressure of steam, or the Engine being light or heavy loaded—is considered by those who have used it to have no equal, and is warranted to give satisfaction. Send for Circular.
LAMB, COOK & CO., Proprietors
20 26* Slatersville, R. I.

TO RAILROAD AND TELEGRAPH COMPANIES.—Telegraph Circuit Breaker and Signal Apparatus. Is readily used by Conductors and Brakemen, and all hindrances to trains on the road immediately telegraphed to despatcher's office. Also, of great value in testing wires out upon the line. Address [4 15*] ALONZO CHACE, Syracuse, N. Y.

GODDARD'S BURRING MACHINE WORKS,
Office, No. 3 Bowling Green, New York,
manufacture the
Patent Steel Ring and Solid Packing
BURRING MACHINES,
Patent Mestizo Wool-burring Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.
Orders respectfully solicited, and prompt attention given, by addressing C. L. GODDARD,
26 tf No. 3 Bowling Green, N. Y.

BULLARD & PARSONS, HARTFORD, CONN. are prepared to furnish Shafting of any size and length, in large or small quantities. Our hangers are adjustable in every point, and fitted with Patent Self-oiling Boxes, guaranteed to run six months without re-oiling, and save 80 per cent of oil. By making a speciality of shafting, we are able to furnish very superior work at reasonable rates. Heavy work built to order. 2 tf

IMPORTANT.
MOST VALUABLE MACHINE for all kinds of irregular and straight work in wood, called the Variety Molding and Planing Machine, indispensable to competition in all branches of wood-working. Our improved guards make it safe to operate. Combination collars for cutters, saving 100 per cent, and feed table and connection, for waved moldings and planing, place it above all others. Evidence of the superiority of these machines is the large numbers we sell, in the different states, and parties laying aside others and purchasing ours, for cutting and shaping irregular forms, sash work, etc.
We hear there are manufacturers infringing on some one or more of our nine patents in this machine. We caution the public from purchasing such.
All communications must be addressed "Combination Molding and Planing Machine Company, No. 211 East 22d-st., New York," where all our machines are manufactured, tested before delivery, and warranted.
Send for descriptive pamphlet. Agents solicited. 10 6*

GOULD MACHINE COMPANY,
Newark, N. J.
IRON AND WOOD-WORKING MACHINERY,
STEAM FIRE ENGINES.
Send for a Catalogue. 5 tf

MECHANICAL DRAWINGS, MAPS, etc. made in the best style, with punctuality, by
10 2*] CHAS. G. HERBERT, No. 11 Pine street, New York.

PLANS AND DESIGNS FOR A
NEW CAPITOL,
AT ALBANY,
STATE OF NEW YORK.
Office of "The New Capitol Commissioners,"
Albany, July 13th, 1866.
Architects are informed that Plans and Designs for a NEW CAPITOL at Albany, will be received by the Commissioners, at their Office, until the fifteenth day of November next, at noon. A printed statement of instructions and details, and of the premiums offered, will be furnished at the Office of the Commissioners, on application in person or by post.
HAMILTON HARRIS, Albany,
JOHN V. L. PRUYN, Albany,
O. B. LATHAM, Seneca Falls.
5 5] Commissioners.

CHARLES A. SEELY, CONSULTING AND Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, Instruction, Reports, etc., on the useful arts. 22

STEAM ENGINES WITH LINK MOTION, Variable Automatic Cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, etc. Address
9 tf] M. & T. SAULT, New Haven, Conn.

HAND RAILING SIMPLIFIED. 3d Edition. This is the only work in the English language which has made the Art of Hand Railing perfectly intelligible to the Carpenter and Joiner. Price $5. Sent to any address on receipt of the price. ROBT. RIDDELL, 1214 Hancock-st., Philadelphia. 8 13

FOR DANIELLS'S PLANING MACHINES, Car Mortising, Boring Machines, Car Tenoning Machines, Car Planing and Beading Machines, etc., address
4 1y] J. A. FAY & CO., Cincinnati, Ohio.

PEW AND SEAT HAT RACK—FOR SALE, the entire and undivided right to Blake's Patent Pew and Seat Hat Rack. If not sold entire by the 15th proximo, the patentee will then dispose of Rights to the States, severally. Competent judges say that this Rack will prove one of the most popular and best selling inventions ever offered to the public. It exactly and happily meets what has long been felt to be a positive and troublesome want. By investing in a right, even to a single State, men of moderate means will find here an opportunity to make a few thousand dollars, promptly, easily, agreeably, usefully. For Circulars stating terms, etc., address, E. S. BLAKE,
10-3*] Pittsburgh, Pa.

MANUFACTURERS AND INVENTORS.—PACIFIC PATENT AGENCY, for opening facilities to Manufacturers and Inventors to introduce their products to the public in the departments of Mining, Mechanics, Agriculture, Domestic, Musical and scientific, on this coast. Address
J. H. ATKINSON,
Northeast Corner California and Kearney streets,
10-6*] San Francisco, Cal.

GEORGE H. WHITTEN, ORGAN BUILDER, Sufferns, N. Y., is prepared to furnish Plans and Specifications for Organs of all sizes; repairing, tuning, etc. [10 4*

AGENTS WANTED—$2,000 A YEAR AND expenses, to male or female; agents to introduce a new and useful invention, absolutely needed in every household. Agents preferring to work on commission can earn from $20 to $50 per day. For particulars, address W. G. WILSON,
10 3] Cleveland, Ohio.

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. [10 tf

$200 A MONTH IS BEING MADE WITH our IMPROVED STENCIL DIES, by Ladies and Gentlemen. Send for our free Catalogue containing Samples and Prices. Address S. M. SPENCER & CO.,
3 tf] Brattleboro, Vt.

REMOVAL.—
AMERICAN LEAD PENCIL CO.,
NEW YORK,
Have removed to
34 JOHN STREET,
New York.
Factory, Hudson City, N. J. 8 4*

THE BEST FORGING HAMMERS ARE MADE by CHAS. MERRILL & SONS, 556 Grand street, New York. They strike a square blow, and will do more and better work, with less power and repairs, than any other Hammer. Illustrated Circulars, giving full particulars, sent on application. 8 tf

CIVIL AND MINING ENGINEERING,
At the RENSSELAER POLYTECHNIC INSTITUTE, Troy, N. Y. The next Annual Session begins Sep. 12. For the new Annual Register, containing full information, apply to
H. 7 7*] Prof. CHARLES DROWNE, Director, Troy, N. Y.

SCHOOL OF MINES, COLUMBIA COLLEGE,
EAST 49TH STREET, NEW YORK.
Faculty:
F. A. P. BARNARD, S.T.D., LL.D., President.
T. EGLESTON, JR., E.M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E.M., Mining Engineering.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORREY, M.D., LL.D., Botany.
CHAS. A. JOY, Ph. D., General Chemistry.
WM. G. PECK, LL.D., Mining Surveying and Mechanics.
J. H. VAN AMRINGE, A.M., Mathematics.
OGDEN N. ROOD, A.M., Physics.
J. S. NEWBERRY, Geology and Paleontology.
The plan of this School embraces a three-years' course for the degree of "Engineer of Mines, or Bachelor of Philosophy." For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry, and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 1, 1866. The examination for admission will be held September 28, 29. For further information, and for catalogues, apply to
5 8*] DR. C. F. CHANDLER, Dean of the Faculty.

TWIST DRILLS (ALL SIZES) FOR STUBBS'S Wire and Machinist's use, on hand for sale by
26 13] LEACH BROTHERS, 102 Liberty street, New York.

10,000 AGENTS WANTED, IN EVERY TOWN, COUNTY, and STATE, to sell Topliff's Patent Perpetual Lamp Wick. Needs no Trimming. Sample sent for 20c; two for 30c. State and County Rights for Sale.
MURPHY & COLE,
3 tf] 81 Newark Avenue, Jersey City, N. J.

CAN I OBTAIN A PATENT?—FOR ADVICE and instructions address MUNN & CO., 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN $3 a year. 30,000 Patent cases have been prepared by M. & Co.

THE 19th ANNUAL EXHIBITION Of American Manufactures and the Mechanic Arts, will be opened in the spacious Hall of the Maryland Institute, Baltimore, on Tuesday evening, October 2d, 1866, and close Oct. 20th.
Articles for Competition and Premium must be deposited before Thursday night, Sept 27th.
For particulars, address the undersigned, or Joseph Gibson, Actuary.
JNO. F. MEREDITH,
7 9] Chairman Exhibition Committee.

IMPROVED STATIONARY AND PORTABLE Steam Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction. Marine Engines, Iron Steamers. Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order. Address T. F. ROWLAND,
9 26* Continental Works, Greenpoint, Brooklyn, N. Y.

IRON CASTINGS AND STEAM BOILERS.—THE HINKLEY AND WILLIAMS WORKS, No 416 Harrison avenue, Boston, are prepared to manufacture common and gun-metal castings, of from ten pounds to thirty tuns weight, made in green sand, dry sand or loam, as desired; Also Flue and Tubular Boilers, and "Hinkley's Patent Boiler," for locomotive or stationary engines, warranted to save a large percentage of fuel over any boiler now in use. 1 13*

CIRCULAR SAWS,
WITH EMERSON'S PATENT MOVABLE TEETH,
Our Patent Teeth inserted in old saws and warranted as good as new. Also, Emerson's Patent Gaging and Sharpening Swage, for spreading the points of saw teeth. Send for descriptive pamphlet with new price list. AMERICAN SAW COMPANY,
7 5*] 2 Jacob street, near Ferry street, New York.

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, N. Y. 1 tf

WOODWORTH PLANERS, BARLETT'S Patent Power Mortise Machine, the best in market. Woodworking Machinery, all of the most approved styles and workmanship. No. 24 and 26 Central, corner Union street, Worcester, Mass. [4 11*] WITHERBY, RUGG & RICHARDSON.

FOR SALE CHEAP.—
One of the celebrated Root & Benjamin Engines, 15 Horse-Power, in complete order, and occupies but little room. Can be seen running for a while at the premises of the undersigned,
BUCKBEE & BROWN.
1 13 Coxsackie, N. Y.

R. BALL & CO.,
SCHOOL STREET, WORCESTER, MASS.,
Manufacturers of Woodworth's, Daniell's, and Gray & Wood's Planers, Sash Molding, Tenoning, Mortising, Upright and Vertical Shaping, Boring Machines, Scroll Saws, and a variety of other Machines and articles for working wood.
Send for our Illustrated Catalogue. 1 51*

LATHES, PLANERS, AND OTHER TOOLS, on hand and to order, from Lowell Machine Shop.
STEVENSON & PEIRSON,
6 13*] 48 Kilby street, Boston.

PORTABLE STEAM ENGINES, COMBINING The maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & Co., Lawrence, Mass. 1 tf

OIL! OIL!! OIL!!!
For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American", after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world. 1tf

J. A. FAY & CO.,
CINCINNATI, OHIO,
Patentees and Manufacturers of all kinds of
PATENT WOOD-WORKING MACHINERY
of the latest and most approved description
Particularly designed for

Navy Yards	Sash, Blind and Door,
Ship Yards,	Wheel, Felly and Spoke,
Railroad,	Stave and Barrel,
Car and	Shingle and Lath,
Agricultural Shops,	Planing and Resawing
Mills, Etc.	

Warranted superior to any in use. Send for Circulars.
For further particulars address J. A. FAY & Co.,
Corner John and Front streets,
Cincinnati, Ohio,
Who are the only manufacturers of J. A. Fay & Co.'s Patent Wood-working Machinery in the United States. 4 1y

PRESSURE BLOWERS.
PRESSURE BLOWERS—FOR CUPOLA FURnaces, Forges, and all kinds of Iron Works. The blast from this blower is four times as strong as that of ordinary fan blowers, and fully equal in strength to piston blowers, when applied to furnaces for melting iron. They make no noise and possess very great durability, and are made to run more economically than any other blowing machine. Every blower warranted to give entire satisfaction. Ten sizes, the largest being sufficient to melt sixteen tuns of pig iron in two hours. Price varying from $40 to $345.
FAN BLOWERS, from No. 1 to No. 45, for Steamships, Iron Mills, Ventilation, etc., manufactured by B. F. STURTEVANT,
1 tf] No. 72 Sudbury street, Boston, Mass.

STEAM AND WATER GAGES, GLOBE Valves and Cocks, Steam Whistles, Steam and Gas Fitters' Tools, Oil Well Machinery, etc. Wrought Iron Pipe and fittings for sale at the lowest rates by JOHN ASHCROFT, 50 John street New York. Send for Circulars. 26 12*

GOVERNORS.

THE GILLESPIE GOVERNOR COMPANY, of Boston, are now manufacturing
GILLESPIE'S PATENT HYDRAULIC GOVERNOR,
for Water Wheels of every description.
After a test of five years' service, this Governor has proved itself far superior to any other hitherto in use, practically accomplishing for Water Power the same as a Cut-off for Steam Power.
Every machine guaranteed to give entire satisfaction to the purchaser, or no sale. Office 13 Kilby street, Boston, Mass.
JOHN S. ROGERS, Treasurer.
TIMOTHY S. HOLTON, Selling Agent.
For sale in New York by J. E. STEPHENSON, 40 Dey street, and GEO. TALCOTT, 69 Liberty street.

☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made. 26 13

RELIABLE PARTIES WISHING TO GET A Line of light iron work manufactured will do well to call on us, as we shall have a lot of light machinery lying idle after Aug. 15, 1866. BULLARD & PARSONS,
5 tf] Nos. 23 and 25 Potter street, Hartford, Ct.

WOOD PLANERS, MOLDING MACHINES, and all kinds of wood-working machinery, in store and for sale by J. B. FULLER,
9 4] No. 8 Dey street, New York.

WHITE'S GOVERNOR VALVE.—RIGHTS in Wisconsin and Minnesota for sale by P. RANSOM, Galesburg, Ill. 9 6*

STEAM ENGINES—PORTABLE & STATIONary—all sizes, with or without boilers, 2 to 300 horse power, new and second-hand, for sale low by J. B. FULLER,
9 4] No. 8 Dey street, New York.

BLANCHARD'S, and KNIGHT'S, and JENkins's Spoke Lathes, and a large lot of Wheel Machinery, of all descriptions, Belting, etc., new and second-hand, for sale low by J. B. FULLER,
9 4] No. 8 Dey street, New York.

ATMOSPHERIC TRIP HAMMERS ARE made by CHAS. MERRILL & SONS, 556 Grand street, New York. They will do more and better work, with less power and repairs, than any other Hammer. Illustrated circulars, giving full particulars, sent on application. tf 9

ENGINE LATHES, PLANERS, DRILLS, shafting, pullies, hangers, scroll and screw chucks, Stubbs's twist drill sockets and drill chucks, portable forges, anvils, vises, and a large stock Machinists' and Blacksmiths' tools, new and second-hand, in store and for sale low by J. B. FULLER,
9 4] No. 8 Dey street, New York.

WANTED.—SOME ONE TO TAKE AN INterest in and manufacture a new Sewing Machine—just patented. Makes the Lock-stitch, without rewinding; also, several other kinds of stitches, warranted to compete with, if not surpass any machine out. Address G. L. DULANEY, Mechanicsburg, Pa 9 5*

PAGE'S GRATE, WATER, FLAME, AND Coal Lime Kiln, on new and scientific principles. Great saving. Fuel, hard or soft coal, peat, or wood. Warranted to burn best finishing lime. Both new and patented 1864, 1866. Rights for sale. C. D. PAGE,
9 6*] Rochester, N. Y.

SCHLENKER'S
IMPROVED BOLT CUTTER.
Late improvements make this the most perfect Bolt Cutter in the maaket. No running back off the thread; dies cheap and easily kept in order. The Cutter Head may be used on the ordinary lathe, and is successfully use i on some of the best Bolt Cutters heretofore in use. Nut taps on hand and made to order. Lathes, improved Shaping Machines and Drills on hand and made to order. Send for circular. Address
W. S. SHAW, General Agent, or
R. L. HOWARD, Manufacturer,
9 4*] Buffalo, N. Y.

T. N. HICKCOX,
Manufacturer of
STAMPED AND PRESSED BRASS GOODS,
Plain and Fancy Brass Caps for Pomatum and Mucilage Bottles, Brass Baggage and Key Checks, Stove Ornaments, Brass Labels for Oil Cans, House Furnishing Goods, Insurance Companies, etc. Steel Dies of any Design Required. Presses and Light Machinery manufactured to order. Prompt attention paid to articles of new manufacture and Patent Goods; Models for the Patent Office neatly executed. Salesroom, 280 Pearl-st., N. Y.; Factory, corner John and Pearl-sts., Brooklyn. 9 4*

FRENCH BURR STONE PAINT MILLS—all sizes. Brainard's Iron Power and Hand Paint Mills.
8 10*] HOLMES & BLANCHARD, Boston, Mass.

BROWN'S FRENCH Burr Portable Grist Mills, all sizes. [8 10*] HOLMES & BLANCHARD, Boston, Mass.

FOR ENGINE BUILDERS' AND STEAM Fitters' Brass Work, address
8 26*] F. LUNKENHEIMER, Cincinnati Brass Works.

THE HARRISON BOILER—A SAFE STEAM BOILER.—This new Steam Generator combines essential advantages in Absolute Safety from explosion, in first cost and cost of repairs, durability, economy of fuel, facility of cleaning, and transportation, not possessed by any other boiler.

It is formed of a combination of cast-iron hollow spheres—each 8 inches in external diameter, and ⅜ths of an inch thick, connected by curved necks. These spheres are held together by wrought iron bolts with caps at the ends. The form is the strongest known. Its strength to resist internal pressure is very great—unweakened as it is by punching or riveting, which lessens the strength of the wrought iron boiler plate about forty per cent. Every boiler is tested by hydraulic pressure at 400 pounds to the square inch. It cannot be burst under any practicable steam pressure.

Under pressure which might cause rupture in ordinary boilers every joint in this becomes a safety valve. No other steam generator possesses this property of relief under extreme pressure without injury to itself, and thus preventing disaster.

It is not affected by corrosion, which soon destroys the wrought iron boiler. Most explosions occur from this cause. It has economy in fuel equal to the best boilers, arising from the large extent and nearness to the fire of its heating surface, as also from the waved line of this surface which, thoroughly mixing the gases, induces better combustion, and breaking the flame, causes the heat to be more effectually absorbed than in the ordinary tubular or cylinder boiler.

It gets up steam quickly, and with little fuel. It produces superheated steam without separate apparatus, and is not liable to priming or foaming.

It is easily transported, and may be taken apart so that no piece need weigh more than eighty pounds. In difficult places of access, the largest boiler may be put through an opening one foot square. It is readily cleaned inside and out. Under ordinary circumstances, it is kept free from permanent deposit by blowing the water entirely out, under full pressure once a week. It requires no special skill in its management. Injured parts can be renewed with great facility, as they are uniform in shape and size. When renewed the entire boiler remains as good as new. The greater part of the boiler will never need renewal unless unfairly used.

A boiler can be increased to any extent by simply adding to its width, and being the multiplication of a single form, its strength remains the same for all sizes. It has less weight, and takes less than one-half the ground area of the ordinary cylinder boiler, without being increased in hight.

Any kind of fuel may be used under this boiler, from the most expensive to refuse coal dust.

Drawings and Specifications free of charge. For descriptive circulars or price address JOSEPH HARRISON, Jr.,
Harrison Boiler Works, Gray's Ferry Road,
9 13* Adjoining U. S. Arsenal, Philadelphia.

STEAM BOILER EXPLOSIONS PREVENTED by use of Ashcroft's Low Water Detector. Over 5,000 in use. Send for Circular. JOHN ASHCROFT, 50 John st., N. Y. 26 12*

TWENTY-FIVE PER CENT OF THE COST of Fuel Saved annually by the use of Hair and Wool Felt as applied and for sale by JOHN ASHCROFT, 50 John street, New York. Send for Circular. 26 12*

THE NONPARIEL WASHING MACHINE.—"A First-class Machine—one that has no rival to our knowledge."—Scientific American.
Send for free descriptive circular to.
OAKLEY & KEATING,
8 11*] 184 Water street, New York.

15,000 lbs. CAST and MALLEABLE PIPE fitting for steam, gas, and water; 5,000 lbs. small malleable fittings for gas fitters; wrought and cast pipe iron and brass cocks; globe check valves, gage cocks, steam and water gages, and a large stock of steam and gas fitter's goods and tools, for sale low by J. B. FULLER,
9 4] No. 8 Dey street, New York.

PATENTED WOOD-BENDERS, FOR FELlies, Furniture, Agricultural Implements, etc. Machines with rights to use, for sale. JOHN C. MORRIS,
9 6* No. 122 East Second street, Cincinnati, Ohio.

ENGINEERS, SURVEYORS, MACHINISTS, Draftsmen, School Teachers, send for the Descriptive Manual of Mathematical Instruments and Drafting Materials, a pamphlet of 112 pages, published and sent free by JAMES W. QUEEN & CO., Mathematical Instmt. Makers, 924 Chestnut-st., Phila. [9 10*

LARGE ENGINE & BOILERS FOR SALE.—Horizontal Engine, 20x24, cylinder very heavy construction, 14 feet fly wheel; 4 Boilers 36 in. diameter, 20 ft. long, 2 13-in. flues each, and steam drums, built of charcoal iron, with all fittings, all in first-class order, and ready for immediate delivery. For sale low by J. B. FULLER,
9 4] No. 8 Dey street, New York.

THE STEAM SIPHON PUMP IS THE MOST simple, direct, and effective device for raising water by steam yet discovered. It is an independent lift and force pump, without piston, plunger, valves, or any movable part. It cannot get out of order, or freeze up, and can be used wherever there is a steam boiler, either with high or low pressure. It is an efficient fire engine, and the best bilge pump known. Address
STEAM SIPHON COMPANY,
9 13* 48 Dey street, New York.

BARREL MACHINERY.—THE AMERICAN Barrel Machine Co. now offer for sale their new and improved machinery for the manufacture of staves for all descriptions of casks, on such terms as will bring it within the means of the smallest cooper. These machines are now in use at South Boston by the "Downer Kerosene Oil Co.," in the manufacture of Merrill's patent grooved barrel, where they may be seen in full operation. Address
AMERICAN BARREL MACHINE CO.,
9 4*] 151 Devonshire street, Boston. Post-office Box 3,219.

MACHINE SHOP FOR SALE.—THE STAMford Machine and Tool Works offer for sale their property and machinery situated within a stone's throw of the depot at Stamford, Conn. The machinery and tools will be sold together or separate, and the Works will be either sold or let at a reasonable rate. This is a fine opportunity for any party desiring to establish business in a good location, as the proprietor will give (if satisfactory arrangements can be made) the exclusive right to manufacture a patented article of machinery which has quite a large sale. The tools are strictly first class and in perfect order. Apply to W. M. BETTS,
9 3] Stamford, Conn.

MACHINISTS' TOOLS FOR SALE.—3 Iron Planers, 15 feet, 36x36; 10 feet, 40x36; 5 feet, 20x18. These have been used about 6 months. 3 Engine Lathes, 10 feet 17 in. swing, 10 feet 20 in. swing, 10 feet 25½ in. do. For particulars and cuts address STEPTOE, McFARLAN & CO.,
Cincinnati, Ohio.

WOODWORTH PLANERS.—

MESSRS. STEPTOE, McFARLAN & CO.,—Gentlemen:—We are highly pleased with the Woodworth Planer and Matcher, purchased from you, and think it superior to any machine of the kind of which we have any knowledge.
WEARY, SNYDER WILCOX & CO.,
July 27, 1866. Akron, Ohio.

☞ Send for circular and price lists.
STEPTOE, McFARLAN & CO.,
9] Cincinnati, Ohio.

WOODWORTH PLANERS—IRON FRAMES to Plane 18 to 24 inches wide, at $120 to $150. For sale by S. C. HILLS, No. 12 Platt street, New York. a

FOR BEDSTEAD AND FURNITURE MAchinery, Friezing, Shaping and Molding Machines, address J. A. FAY & CO., Cincinnati, Ohio. 3atf

MANUFACTURERS OF TEXTILE FABRICS. DUTCHER'S PATENT TEMPLES, adapted to weaving all inds of goods. Also
THOMPSON'S PATENT OIL CANS
for oiling Machinery; neat and economical. Furnished by
21 13 eow* E. D. & G. DRAPER, Hopedale, Mass.

PLATINUM APPARATUS, WIRE, ORE, etc. For circular, address
9 5 eow] H. M. RAYNOR, 748, Broadway, New York.

ANDREWS'S PATENT PUMPS, ENGINES etc.—
CENTRIFUGAL PUMPS, from 90 Gals. to 40,000 Gals. per minute, capacity.
OSCILLATING ENGINES (Double and Single), from 2 to 250 horse-power.
TUBULAR BOILERS, from 2 to 50 horse-power, consume all smoke.
STEAM HOISTERS, to raise from ½ to 6 tuns.
PORTABLE ENGINES, 2 to 20 horse-power.
These machines are all first-class, and are unsurpassed for compactness, simplicity, durability, and economy of working. For descriptive pamphlets and price list address the manufacturers,
W. D. ANDREWS & BRO.,
3 tf] No. 414 Water street, N. Y

AMERICAN PEAT COMPANY.—THIS COMpany, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use.
1 12* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

IRON PLANERS, ENGINE LATHES, DRILLS, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address
2tf] NEW HAVEN MANUFACTURING CO., New Haven, Ct.

"POWER-LOOM WIRE CLOTHS" AND nettings, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. 1 36*

MODELS, PATTERNS, EXPERIMENTAL and other Machinery, Models for the Patent Office, built to order by HOLSKE & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 1 tf

OXY-HYDROGEN STEREOPTICONS,
OXY-CALCIUM STEREOPTICONS,
DISSOLVING LANTERNS,
MAGIC LANTERNS, Etc., Etc.
A Large Assortment of American, European, and Foreign Photographic Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 pages, will be sent free by Mail on application.
WILLIAM V. McALLISTER,
21 52* 728 Chestnut street, Philadelphia.

SMITH'S PATENT FUSIBLE SAFETY VALVE OR PLUG.—These Plugs are in extentive use in England, and are the best application of fusible alloy, for safety from accidents by low water or over pressure; are self-acting, and cannot be tampered with. For sale by
CHARLES W. COPELAND, No. 171 Broadway,
9 8] Sole Agent for the United States.

SAVE YOUR FUEL.—CARVALHO'S IMPROved Steam Super-heater (easily attached to any boiler), prevents "priming," and furnishes pure steam to the engine, saving 25 per cent of fuel. It will also supply dry steam, for heating or drying purposes. Agents wanted in Pennsylvania, Ohio, and Illinois.
For circulars, etc., address HENRY W. BULKLEY,
9 4*] 57 Broadway, New York.

HAYES'S RAILROAD FAST EXPRESS WAGES COMPUTING TABLES. The most complete work of its kind ever published. Valuable for everybody employing labor. Send for circular of information and sample to LESTER HAYES, Kent, Portage county, Ohio. 7 5*

MASON'S PATENT FRICTION CLUTCHES, for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by
6 tf VOLNEY W. MASON, Providence, R. I.

ERICH'S PATENT
SELF-ACTING PUMP,
is especially suited for draining cellars, ice houses, etc. It requires no manual labor, being absolutely self-acting. It starts itself whenever the water collects in the well in which it is placed, and stops of its own accord when it has pumped it out. Agents wanted in all cities that are supplied with hydrant water. Address
8 4*] DR. A. F. ERICH, 116 S. Broadway, Baltimore, Md.

WROUGHT IRON TACKLE BLOCKS—all sizes. Also, Doyle's Patent Hoisting Machines, on hand, for sale by LEACH BROTHERS,
5 13] 102 Liberty street, New York.

WATER WHEELS.—Warren's American Turbine Wheel is extensively taking the place of other wheels throughout the country, where great power, and the saving of water is required. Address
A. WARREN, Agent American Water Wheel Co.,
5 12*] 31 Exchange street, Boston, Mass.

BRAYTON'S SAFETY STEAM GENERATOR and Engine. A Perfect Success. The long-sought for object has been accomplished, to wit:—A means by which steam can be generated safely and used with all its power, without the least danger of explosion under any circumstances conceivable. Send for Circular. R. A. HUTCHINSON, Agent, No. 8 Dey street, New York. 8 4*

STEAM ENGINES AND BOILERS.—
THE ALBERTSON & DOUGLASS MACHINE CO.,
New London, Conn.,
have on hand, and are now building, Engines of 8, 10, 11, 12, 14 and 16 inches diameter of Cylinder. Latest improved Circular Saw Mills. Cotton Gins for Hand and Power. Steam Boilers of any size made to order. 5 7*

AMERICAN EMERY.—GUARANTEED SUperior to any other Emery in the market. F. K. Sibley's Emery Cloth, covered with American Emery, superior to any other. By F. W. BACON & CO., 84 John street,
Sale agents for New York City. 1 12*

MACHINERY AND MACHINISTS' TOOLS, all kinds, including the LEONARD & CLARK PREMIUM LATHE. Also, Steam Engines, Saw Mills, Wood Cutting Machinery, etc., etc. Steamboat and Machinery Repairing at the
4 8*] QUASSAICK MACHINE SHOP, Newburgh, N. Y.

THE AMERICAN VISE—A WELL-CONstructed Parallel Vise, recently Patented—a great improvement on all others. All sizes on hand, by F. W. BACON & CO., 84 John street, Sale Agents, New York City. 1 12*

LENOIR PATENT GAS ENGINES,—WITHout fire, coal, smoke, or noise. Operated by petroleum, or coal gas. Ignited within the cylinder by the electric spark. Half-horse to four-horse power, for pumping, sawing, turning, hoisting, grinding, etc. With portable gas generators for farms and plantations. Manufactured exclusively at the
LENOIR GAS ENGINE WORKS,
26 10* 435 East Tenth street, near Avenue D, New York.

ANDERSON & SCHERMERHORN, PATENT and Model Makers, Gearing Cocks, Valves, and Engines. Patterns of every description. Rear No. 47 Ann street, New York, second floor. 11 tf

MORSE'S Patent TWIST DRILLS, CHUCKS, SOCKETS, etc.
A full assortment may be found in New York at F. W. Bacon & Co.'s, 84 John street; Peter A. Frasse, 95 Fulton street; Nathusin, Kugler & Morrison, 229 Bowery. In Boston, at A. J. Wilkinson & Co.'s, No. 2 Washington street; May & Co.'s, No. 1 Broad street. In Philadelphia, Wm. P. Walter & Son's, 1,233 Market street. In Hartford, at Francis & Gridley's, 343 Main street. In San Francisco, at Marsh, Pilsbury & Co.'s, corner Pine and Front streets. In London, England, at Keith & Co.'s, 16 ½ Fenchurch street, and at the Factory, corner Fourth and Bedford streets, New Bedford, Mass. 1*

WOOD & MANN STEAM ENGINE CO.'S CELEBRATED PORTABLE STEAM ENGINES, from 4 to 35 horse-power. Also, PORTABLE SAW MILLS.
We have the oldest, largest, and most complete works in the United States, devoted exclusively to the manufacture of Portable Engines and Saw Mills, which, for simplicity, compactness, power, and economy of fuel, are conceded by experts to be superior to any ever offered to the public.
The great amount of boiler room, fire surface, and cylinder area, which we give to the rated horse-power, make our Engines the most powerful and cheapest in use; and they are adapted to every purpose where power is required.
All sizes constantly on hand, or furnished on short notice. Descriptive circulars, with price list, sent on application.
WOOD & MANN STEAM ENGINE CO.,
7 52] Utica, N. Y. Branch office, 96 Maiden Lane, N. Y. City.

$200 per MONTH is MADE by AGENTS selling the Parker Sewing Machine—the most perfect in existence. Parker Sewing Machine Company, Cincinnati, Ohio. 8 13

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.
Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten,

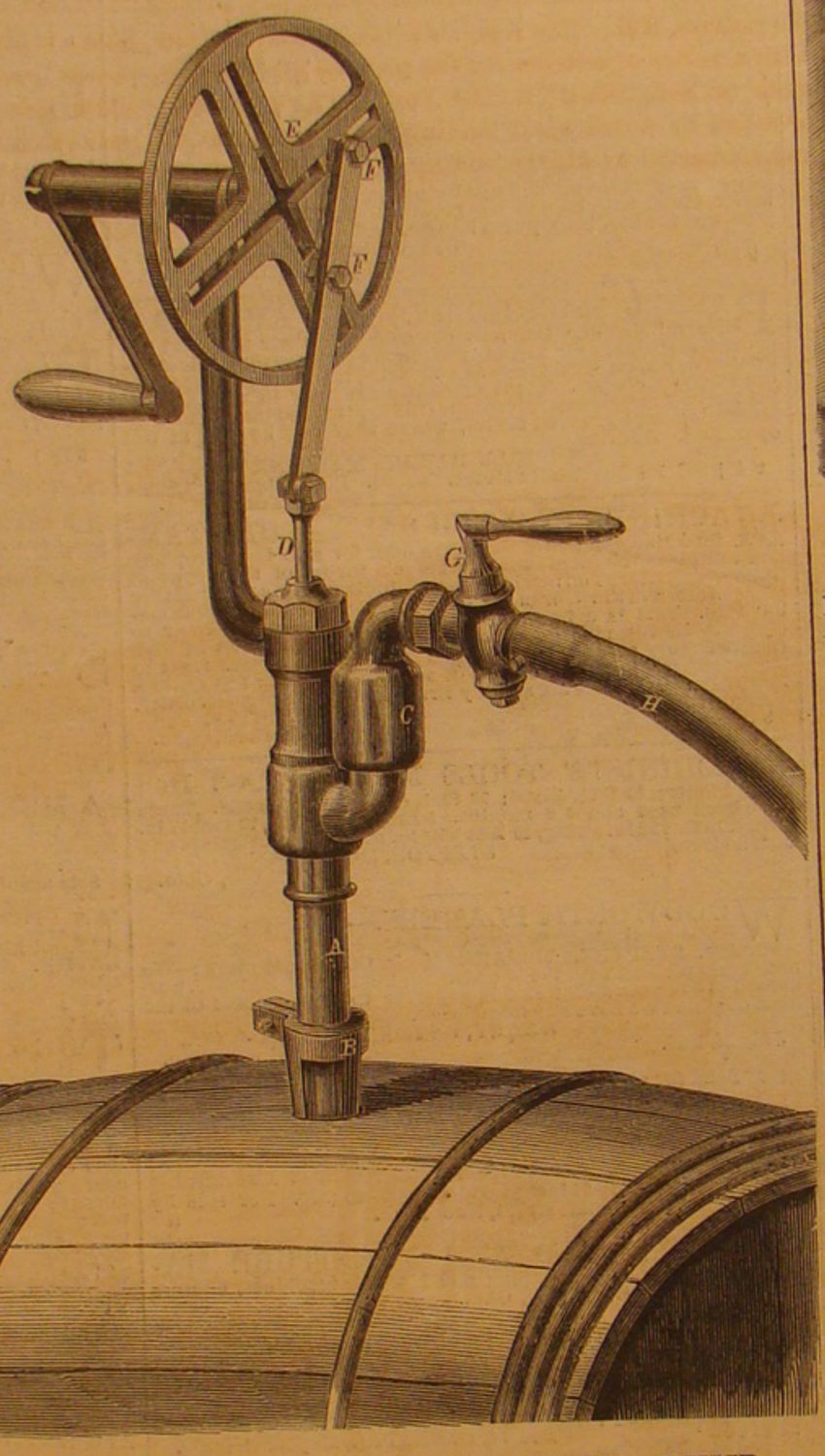
nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in de Ver. Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.
Preis 20 Cts., per Post 25 Cts.

Portable Liquor and Transfer Pump.

Those accustomed to the common barrel transfer pump will see at once the value of the improvement herewith illustrated. The direct application of the hand to the reciprocating motion of the piston of the ordinary pump is very trying to the muscles of the arm. It is claimed for this improvement that the use of this pump is far less wearying, and that it does the same amount of work in one-third the time. It is light, portable, and durable, and not liable to get out of order.

A is the pipe of the pump, which can be made of any length. It is furnished with studs at its lower end, which steady it in the barrel, and keep the bottom from the inner surface of the cask. At the bung hole it is secured by the enveloping wedge, B, which is fastened to the pipe by a set screw cramping it snugly. C C contain the valves. The plunger, D, is worked by the "slosh wheel," E, which gives two strokes of the plunger at every revolution, by means of the sliding boxes, F, working in their respective slots. G is a stop cock to which the hose, H, is attached.

This improvement was patented July 17, 1866. The entire patent right is for sale by Tully & Reece, 235 Dock street, Philadelphia, Pa.



TULLY & REECE'S LIQUOR AND TRANSFER PUMP.

A Blowing Cave.

There is a natural curiosity in Georgia, known as the "Blowing Cave." It is situated on the plantation of Colonel David Barrow, Decatur county, Ga., twenty-seven miles from Thomasville, the termiuus of the Savannah and Gulf Railroad. The cave is at the bottom of a small natural basin (whose diameter at any point will not exceed thirty feet), in a perfectly smooth plain, and surrounded with a dense copse of wood. From the mouth of this cave issue strong currents of air, with a continuous roar that is heard seventy yards off. At certain hours of the day, a hat or vail, or other light objects thrown at it, are blown six or seven feet high into the air, and at other hours of the day, with a suction relatively great, the mouth of the cave draws in any such article placed near it.

Elastic Cartridges.

M. Seguier recently read an interesting paper to the French Academy of Sciences on a modification effected on rifles by a Belgian manufacturer. Several breech-loading rifles, of different calibers, were produced, the cartridges for which were so contrived as successively to conquer the inertia of the projectile by means of the gradual compression of an elastic body inserted between the powder and the missile, which consists of a steel cylinder rounded off at the top. M. Seguier also produced a plate of soft iron, 14 millimetres (about half an inch) in thickness, shot through and through at a distance of 100 meters, a bullet weighing 45 gms. and a charge of 6½ gms. of fine gunpowder; also a steel plate 29 millimetres, or more than an inch thick, likewise shot through at a distance of 100 meters, with a projectile weighing 125 gms. and a charge of 55 gms. of powder; the missile being in each case so constructed as to have its center of gravity placed far beyond the middle, and the powder being fired at the top of the cartridge just below the bullet, by means of the explosion of a percussion cap placed inside, and struck by an air-tight piston. The elastic body placed between the charge and the bullet consists of several disks of felt, those nearest the middle being impregnated with a solution of fatty substances. The importance of this elastic wadding cannot be underrated, since, if its length be diminished, the recoil will increase and the balistic effect will diminish in proportion. Its presence also does away with the fire which accompanies the explosion at the muzzle, and which is replaced by a line of whitish smoke; the report loses its shrillness, and becomes more like the boom of a piece of ordnance. M. Seguier concluded with requesting the Academy to open a sealed packet he had handed in on the 19th of March, 1849; this being done, it was found that M. Seguier had at that period entertained the idea of placing an elastic substance (vulcanized india-rubber) between the ball and the cartridge.—*Mechanics' Magazine.*

Improvement in Fire Engines.

An improvement in fire engines has been recently tested by H. J. Johnson, of Providence, the object of which is to retain the water in the hose at full pressure when the engine ceases working. A faucet is attached to the nozzle, which shuts back the water whenever desirable, and the extra pressure operates upon a delicately-adjusted valve, in an attachment to the engine, and which in fact becomes a part of it, which opens and permits the water to flow back into the engine. This relieves both hose and engine from any extra pressure. The engine continues working as long as may be desirable, the water in meantime circulating through the valve, which ceases the instant the nozzle is opened and the water begins to flow through the hose.

LIFE PRESERVER.—Mrs. Edson, of Cambridge, Ill., has patented a very convenient life preserver, which deserves notice. It is easily inflated, and is so constructed that when the air is expelled, the preserver collapses, and can be carried in the pocket.

WHITE'S MOP WRINGER.

Mopping floors is at best an unpleasant and dirty job. The long-handled mop saves much labor and prevents much fatigue, but the strain on the muscles of the wrist in wringing the mop is considerable. The simple device here illustrated is a successful attempt to relieve the housewife of a portion of the annoyances of house cleaning.

It consists of a light wooden frame, the ends curved to correspond with the circumference of the pail, and is secured to the pail by means of a cam lever under one of the cross pieces. A roller, A, turns on journals in the frame, and another, B, revolves in a supplementary frame, C, pivoted at D. Spiral springs affixed to the frame at D raise the pivoted frame and uncover the pail. When the mop is to be removed from the pail the frame, C, is pressed down by the foot, and held in position as the mop is drawn through the rollers. The attachment can be fixed permanently to a pail, or detached and used on any proper vessel.

For further information address J. F. White, Brattleboro, Vt.

IN 1865 there were coined at the British Mint 1,450,238 sovereigns, 1,834,750 half sovereigns, 1,580,040 florins, 5,619,240 shillings, 1,631,520 sixpences, 4,158 fourpences, 1,746,888 threepences, 4,752 silver twopences, 7,920 silver pence, 8,601,600 bronze pence, 8,064,000 halfpence, and 4,659,200 farthings. The halfpenny is the coin of which the largest number has been issued in the last ten years; in that time more than 153,000,000 of halfpennies have been coined.

MECHANICS

INVENTORS, MANUFACTURERS.

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other Manufacturing Interests. Also, Fire-arms, War Implments, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc., Household, Horticultural, and Farm Implements—this latter Department being very full and of great value to Farmers and Gardeners, articles embracing every department of Popula Science, which every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent Law Decisions and Discussions, Practical Recipes, Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July,

Per annum.....$3 00
Six months.....1 50
Ten copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free

Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

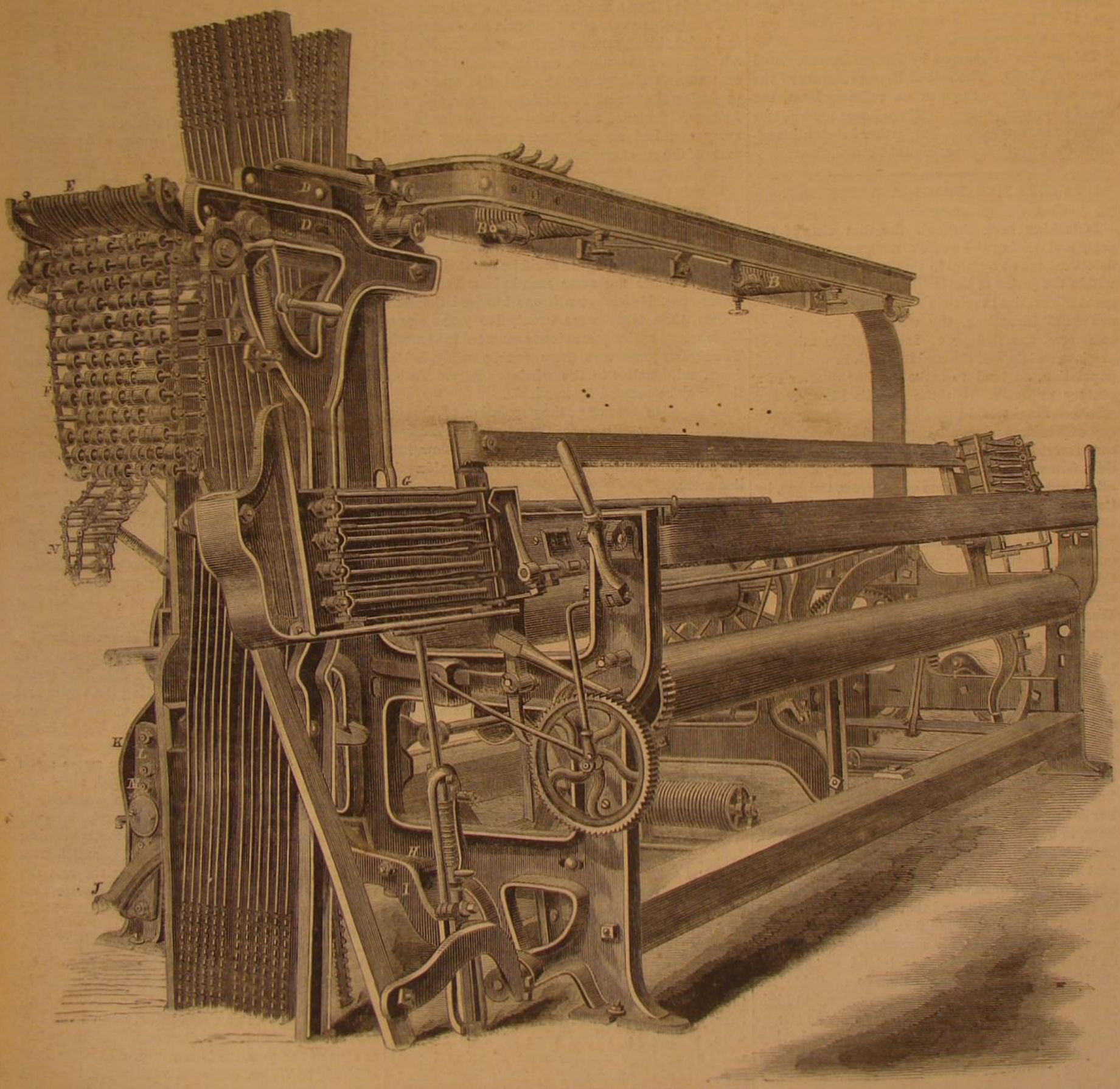
Scientific American.

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

Vol. XV.—No. 12. [NEW SERIES.] NEW YORK, SEPTEMBER 15, 1866. $3 per Annum, [IN ADVANCE.]

Improved Fancy Loom.

The loom here illustrated is designed for weaving all kinds of figured fabrics, such as cassimeres, balmorals, shawls, woolen shirting, broadcloths, and all styles of fancy cotton and woolen goods.



DUCKWORTH'S PATENT FANCY LOOM.

The principal improvements on the loom are the harness motion and deep-box motion. The harness motion is shown at the left of the engraving; it will take in twenty-four harnesses. A is the side eddle lever, pivoted at the center and vibrating in both directions. It is connected to the eddle frames with round leather straps—not shown—passing around the pulleys, B B. The side eddle levers are provided with a series of notches for the purpose of obtaining more or less "shed" on the yarn. The motion is operated by a rock shaft having its bearings at C, and connected to knives sliding in parallel ways—not shown—at D D. One of these knives slides in one direction and the other in the opposite one. There is a set of hooked jacks connected to the side eddle levers, passing between the knives and resting on a set of levers, pivoted at E, and passing over the chain, F. If there are pulleys on the chain, F, they will raise one or more of the levers and elevate the hooked jacks to the upper knife, and as the knife moves it will carry the jack and vibrate the side eddle lever in the same direction. If there are no pulleys on the chain, F, the levers, E, will remain down, and the hooked jacks will rest on the lower knife; and, as the knife moves, will carry the hooked jack and vibrate the side eddle levers in an opposite direction. The chain, F, can extend to the floor without interfering or being supported.

This motion is built very strong and is designed for weaving heavy and light goods. It is secured by Letters Patent dated August 1, 1865.

Next is the novel arrangement of the deep-box motion that is creating considerable interest among manufacturers. This motion commands any shuttle or color out of four, a point that has been long sought for, but has not heretofore been accomplished with success. The shuttle boxes, G, are operated by an inclined-plane-shaped cam, sliding at H, on which the shuttle-box lever, I, rests. The cam, H, is connected to a cross-arm, at J, which is vibrated by hooked arms, connected at K L M, which are attached at different distances from the center or pivot, and are operated by a vibrating lever—not shown—and governed by the pattern chain, N. If the bracket arm connected at K, be operated, it will move single boxes; but if the hooked arm, connected at L, be operated, it will skip from the first box to the third; and if the hooked arm, connected at M, be operated, it will skip from the first to the fourth box, or what is called fall deep or four boxes. The boxes are carried in the same way by similarly hooked arms attached at the lower end of the cross-arm. The shuttle boxes on the opposite end of the loom are operated by a shaft passing through the loom and connected to the cross-arm.

This motion is secured by Letters Patent, dated January 9, 1866. The rest of the movements of the loom are similar to those on an ordinary loom, but are of improved patterns. These looms are built for broad or narrow goods. For further information address Duckworth & Sons, Mount Carmel, Conn.

TWENTY-FIVE YEARS---A RETROSPECT.

In looking back through the dim vista of the past, and noting the world's advancement, we can detect no era so fruitful in results as that embraced within the period of the last twenty-five years. The great discoveries in science and the arts, the numerous useful inventions, the wonderful expansion of commerce, the finding of inexhaustible mines of precious metals, and the rapid growth in wealth and population, all tend to make the last quarter of a century unparalleled in the world's history. The whole civilized world has felt the impetus of growth and expansion, and we are happy to believe that our own favored land, untrammeled by the traditions and dead forms of the Old World, has not only distanced all other nations in the race of progress, but has, by its example of energy and enterprise, infused new life into effete and decaying nationalities.

Less than twenty-five years ago the first successful experiment with electro-telegraphy was made, though it had been the subject of investigation for some years previous. A wire was stretched from Washington to Baltimore in 1844, and soon after extended to New York, and very rapidly throughout the country and the world, till, at length, the earth is girdled, and time and space are literally annihilated. The author of this wonderful discovery still lives, in the enjoyment of a green old age, rich in honors and the substantial rewards of his genius.

Twenty-five years ago ocean steam navigation was a new thing, and its practicability had just been demonstrated. True, years before a little steamer, known as the *Savannah*, had crossed the Atlantic, but her daring feat had long been forgotten, never, perhaps, to be recalled, had not the Western World been waked up one morning by the astonishing news that the *Sirius*, a small English-built steamer, had arrived from London. The *Sirius* was soon followed by the *Great Western*—and thenceforth, ocean steam navigation became a fixed fact. Before, there had been no steamships, only steamboats—useful craft on lakes and rivers, and other inland waters—but the idea that steam could be made available for navigating the ocean had long been scouted in high places. Twenty-five years ago there were no steamships of war, but, ocean steam navigation having been demonstrated as practicable, the nations ceased to build sailing vessels for war purposes, and rapidly substituted steamers.

Twenty-five years ago most of the inventions of agricultural machinery, which now so lighten the labors of the farmer, while they increase his gains, were unknown. Who ever heard of the reaping machine till it made a sensation at the London Exposition in 1850? It must have had a brief existence before that, for it was sent, a perfected engine, from Chicago to London; but how few had ever heard of it; and now, who would think of working even a twenty-acre farm without its aid?

Twenty-five years ago there were railroads with locomotive engines, but they date only a few years anterior. The writer of this well remembers reading the account of Mr. Stephenson's first sucess in England, and he has not forgotten when the first short line was put in operation in this country. Twenty-five years ago railroad connection between the Hudson River and Lake Erie was scarcely completed, the Erie and the Hudson River lines were hardly thought of, and in the Great West, where the railroad may be said to have achieved its greatest triumphs, it had no existence at all. If the last twenty-five years did not witness the origin of the railroad, it has seen its wonderful expansion, until this country and Western Europe have been converted into gigantic gridirons by the crossing and interlacing of iron bands, and all other modes of land travel have become nearly obsolete, and a five-mile journey in an old-fashioned stage coach is more to be dreaded than a hundred miles in a rail car.

Twenty-five years ago California was unexplored and uninhabited, save by Indians and a few Mexican adventurers and outlaws, and its wealth of precious ores was a well-kept secret; and the other gold-producing States and Territories—Nevada, Colorado, Arizona, Montana, and Idaho—now so familiar to every ear, had no existence, save as they formed parts of the great unexplored Far West of the Rocky Mountain region.

Twenty-five years ago a hundred thousand dollars was regarded as a magnificent fortune, to which, though many aspired, few attained; and the number in the metropolis of the Western World whose estates reached this figure could be counted on one's fingers. There are more men in New York to-day whose annual incomes reach one hundred thousand dollars, than there were twenty five years ago of those whose entire possessions amounted to as much. Twenty-five years ago there were, possibly, half-a-dozen millionaires in the whole country. To-day they may be counted by hundreds.

Twenty-five years ago the population of the city of New York was little over three hundred thousand. To-day it is a round million, and the overflow into the adjacent country may be reckoned at half a million more.

Twenty-five years ago the population of the Empire State was less than two and a-half millions. To-day it cannot be much less than five millions.

Twenty-five years ago the population of the entire country was only seventeen millions. To-day it is nearly forty millions.

Twenty-five years ago there were twenty-eight States in the Union. To-day there are thirty-six, with half-a-dozen more to be added within a few years.

The world moves; but such wonderful strides as it has made within the last twenty-five years former generations never saw. Every department of life has felt and seen its accelerated motion; and it is almost enough to make one feel giddy to look back over the last quarter of a century and witness the rapid succession of discoveries in art and science, and the wonderful increase in wealth and population.

And what is the secret? It is the wonderfully-developed spirit of invention which has infused energy and enterprise into the world, and encouraged men to undertake the accomplishment of things which, without the inventor's aid, would have been wild and chimerical.

In 1840, the United States Patent Office issued less than five hundred patents; in 1865 it issued six thousand. This is the key to the whole secret. Of the fifty thousand patents issued during the last twenty-five years in this country, some doubtless were worthless; others were of little account; while a very large number were of value beyond the power of man to compute. Their importance to commerce, to manufactures, to mining, and to agriculture, cannot be estimated. Who will undertake to compute the value of the sewing machine, to cite a single example; or how long would the gold fields of California have continued to give a profit to the miner, if the inventor had not come to his aid?

To the inventor and the mechanic, then, rather than to the statesman and the politician, is the world indebted for the wonderful growth of the last twenty-five years. They are the pioneers in the great army of progress, the *avant couriers* of every great social and moral revolution. ANTIQUARY.

Williams's Theory of the Diffusion of Steam.

[For the Scientific American.]

Charles Wye Williams, whose death was noticed recently, was for nearly forty years superintending agent of the Dublin and Liverpool Steam Packet Company. His practical experience in all the details incident to steam navigation, combined with a good share of scientific knowledge, render his opinions worthy of more than ordinary weight. The subjects to which his attention were more particularly directed, were the combustion of coal, heat, and steam.

Upon the former subject he published a work many years ago, which has become a text-book wherever it has been introduced. His views and opinions—the result of his own experience—received the sanction of such men as Dr. Ure, Prof. Brande, Robert Kane, and others of scarcely less note in the scientific world. A vast saving in fuel was the immediate result of adopting his system; and most of the patented devices of the present time, for mingling a suitable quantity of oxygen with the products of combustion, are but modifications of his discoveries and experiments. He was essentially a practical man, and where possible, he never failed of illustrating his ideas by diagrams and presenting them in visible form to the eye. At a much later day he published a work upon heat and steam, but his views upon these subjects, although the result of his own experience and observation, after a long and patient investigation, seem to have received but little attention, for the reason, probably, that they were opposed to the received opinions of the day. They, at least, brought him in collision with those whose previous writings had been considered as law upon the subject. The distinctive feature of the work is his doctrine of the diffusion of steam through the mass of the water. He contends that when a steam boiler is under pressure there is just as much steam contained in a cubic inch of the water space as there is in a cubic inch of the steam space. The water is, in fact, so far as the steam is concerned, empty space, or a vacuum into which the vapor enters. In this view he was supported by the previously-written opinion of Dr. Dalton, Sir John Herschel, and others, in their remarks on the diffusion of gases and vapors through liquids. He carried out to its legitimate result the now generally received "atomic theory," illustrating his position by diagrams of his experiments, and seeming, at least, to settle the point in his own favor.

In relation to the explosion of steam boilers, he repudiates the idea that heat can be "stored up" in the water, or that the water can flash into steam when relieved of pressure, according to Colborn and Clark, Dr. Alban, and many others. But he contends that the globules of steam in the water, being confined in a medium over eight hundred times as dense as the steam alone, fly into the steam space instantly when the pressure is removed, and there expand in volume in proportion to the density of the two mediums, or over eight hundred times. If the boiler was already strained to near its bursting point, a disastrous result might well be anticipated. If his theory of the diffusion of steam through the water is correct, we may pretty safely assume that his theory of steam boiler explosions will account for some, at least, of those disasters.

There are other phenomena in connection with this subject of heat and steam which can scarcely be accounted for upon any other hypothesis than that of Mr. Williams. For instance. Why will the temperature of water, in a steam boiler, when heated to say 300 deg., fall to 212 deg., or the boiling point, as soon as the pressure is removed, no matter how suddenly? Water, compared with vapor, is a solid body, and any other solid body, as metal, for instance, would retain its high temperature for a long time. But the mercury, though plunged to the center of the mass of water, will, just as soon as the pressure is removed, drop to the boiling point.

H. N. T.

GOLD quartz is profitably mined in Australia when it yields only two dollars per ton.

Moire Antique.

This term is familiar to dealers in silks and those who wear them, but comparatively few know why it is applied to the class of goods bearing the name, or what is the process by which their peculiar character is given to them. As with most other articles in common use, the mass of persons are content to wear them without knowing any thing about how they are produced. The name is of French origin, as well as the goods, the word *moire* meaning simply watered, and is applied to the silks which have a wavy appearance imparted to them by being stamped when damp, and are consequently also called watered. The *antique* is added because of the resemblance which these goods bear to the heavy fabrics worn by our ancestrial grandams. Their peculiar appearance is owing to a slight inequality in the surface of the silk, and is produced either by an arrangement of the woof in the weaving, or by operating upon the surface after it is completed. A slight twisting of the threads composing the woof will give an undulating appearance to the silk by changing from place to place the angle of reflection of the light, but this effect is more commonly produced after the process of weaving has been completed. The discovery of this peculiar effect is said to have been accidental. A piece of silk rolled tight, when a little damp, was found to have this wavy appearance imparted to it, which suggested the idea of applying pressure, by which it is now effected. Machinery enables the manufacturer to give it any style of watering that he may choose. Two cylinders are prepared, one or both of which have slight prominences or depressions corresponding to the lines which he wishes the fabric to bear, and it is then passed between the cylinders under a heavy pressure, giving it a permanent stamp or figure. As the whole effect is produced by the reflection of the light, and as the unequal reflection depends upon the angle which different parts of the surface make with the rays, what is called the watered appearance is thus produced. The process is greatly facilitated by having the silk dampened before it receives the pressure, and still more by heating the cylinders, just as in the laundry the sprinkling of linen and the use of hot iron make the smoothing process more easy and the effect more complete and permanent. There is a great variety in the styles of watering. Some are simple and others more elaborate, the smaller patterns being more frequently known as watered and the larger more technically *moire antique*, but the process is the same, and the effect is owing to the same cause.

The preparation of this style of silks was formerly confined for the most part to France, where the art was kept secret for a long time, but it is now largely carried on in other countries, and to some extent in our own. It is a branch of the dyer's art to give to plain silks this watered appearance, and it is carried to such an extent that any style or pattern may be matched. Other fabrics beside silks are treated in the same way. What is known as moreen, a worsted material, has the same general appearance imparted to it by a similar process, but the effect is not as great, owing to the superior luster of silk, which gives it greater power of reflecting light, and thus makes the variety of the surface much greater. —*New York Journal of Commerce.*

The North Pole.

Two French gentlemen recently explored the island of Spitzbergen in a manner never before done. They have measured the mountains, mapped the whole coast, examined the vegetable products, the geological composition, etc., of the island. They have found that the long day extended over several months, during which the sun never sets, becoming intensely hot after a month or two by the unceasing heat from the sun. In this period vegetation springs up in great luxuriance and abundance. The North Pole is only a matter of 600 miles from the island, and it is thought by the two explorers, as by many others, that the pole itself, and the sea which is supposed to surround it, could be reached from Spitzbergen without many great difficulties being encountered. A singular fact noticed by the explorers, in connection with this island, is the enormous quantities of floating timber which literally cover the waters of the bays and creeks. A careful examination of the character, condition, and kind of these floating logs would, no doubt, lead to a conclusion as to whence and how they came, and probably suggest new theories for the solution of geographical problems connected with the arctic seas.

Improvements Going on South.

The South is going into manufacturing. All over the country new cotton mills are being built and put in operation. Georgia has heretofore nearly monopolized this branch of industry at the South; but now Mississippi and Alabama as well as the Carolinas are waking up to the advantage of the manufacture of cotton goods. At Camden, Alabama, a wealthy company have taken the initiatory steps to erect a large building, and fill it with the most approved machinery. At Carrollton, Mississippi, a factory is now in operation, which, in a short time, will employ one hundred and eighty spindles. In Marengo county, Alabama, they are making arrangements to manufacture on a large scale. At Cuba station, Sumter county, a factory is shortly to be in operation. These are a few of the indications that the South will soon become filled with factories. The results of the war in throwing capital into an entirely new channel, the facilities of easy intercommunication, abundance of material to be used in manufacturing, contiguity to the said material, equability of temperature, and a thousand other facts, point out this region as the future home of the factory.

Sawing Lumber.

We give the points of a long communication from Mr. J. W. Churchill, for the whole of which we have not room. He corrects some errors, in this communication, which appeared in No. 20 of Vol. XIV. viz: that for "contracts" it should read "counteracts the range of the saw," and for "running out at the log" it should be "running out of the log."

The instructions in that article comprehended the sawing of all sorts of lumber, hard and soft. Our correspondent insists that, notwithstanding the objections urged against his rules, they are correct and useful; that end play of the mandrel will make good work, and is preferable to changing the range of the saw many times a day. He has run a saw according to his rules many years, sawing millions of feet of lumber, and always did good work without changing the range of the saw, but allowing it to adjust itself to the different kinds of lumber. He thinks Emerson's rule of nine hundred feet per minute for the edge of a circular saw, is too slow, and that 16,000 feet of lumber sawed in an hour is a large amount, especially when applied to oak or maple. He objects to swedging alone, and prefers setting the teeth, as he has not swedged his saw for three years. He has sawed 2,200 feet of half-inch boards in one hour and eight minutes, and 18,000 feet in one day, always allowing end play.

The Change of Leaves.

The cause of the beautiful tint which our foliage assumes during the autumnal months, has long been a subject of investigation, and many are the hypotheses that have been put forth in explanation.

M. Fremy, who has devoted considerable attention to this subject, stated, as the result of a series of experiments, that he had succeeded in resolving the green coloring matter of the leaf (*chlorophyll*) into two components, one, a yellowish substance, he called *phylloxanthine*, the other a blue matter for which he proposed the name *phyllocyanine*. By considering the blue as more evanescent, the different shades of yellow leaves might be produced.

These views were very generally accepted till recently Fremy has again appeared, essentially retracting his original views. He now gives, as the result of subsequent experiments, the new supposition that *chlorophyll* is a simple green coloring matter very unfixed, being influenced by vegetation, thus passing through varied modifications.

M. Carey Lea, of Philadelphia, has lately advanced a theory in which he considers light as the primary cause, producing photographic changes of color.

During the healthy state of the leaf, vitality counteracts this influence, but as the fall approaches the frost begins its work; the petioles dry up, the leaf gradually loses its firm hold upon the branch, then the action of light, no longer held in check by the vital principle, predominates, the leaf falls away, but in fading acquires those brilliant hues that will soon variegate our forests.

MISCELLANEOUS SUMMARY.

It is stated that the salt mines of Nevada throw in the shade all others known in the United States. One bed is reported to cover 52,930 acres, yielding 2,000,000 bushels annually of salt, ninety-five per cent fine. No bottom to this salt bed has ever been discovered. As deep as any work has gone, the bed is solid rock salt, and from a depth of thirty-five feet the salt water comes so rapidly as to prevent work without efficient working arrangements. The salt water wells up to the surface and overflows the large floor from which the fine white salt is continually gathered. This floor, several acres in area, has been so well leveled that the water flows evenly over it, and this, by exposure to the atmosphere, is rapidly evaporated, leaving a stratum of fine salt. This yield and production go on continually, and the more rapidly it is removed the better the quality of this salt.

M. G. Planté has communicated to the Academy of Science at Paris, a description of his new apparatus for the production of ozone, by using electrodes of lead, in place of platinum, when ozone is sought by the electrolysis of water. He asserts that he can secure a much larger proportion than is obtained in the usual way.

Artificial Diamonds.—A correspondent of the *Mechanics' Magazine* details a process he has employed for crystallizing carbonic acid by means of a continuous electric current. At the end of three weeks he obtained a number of milky-white crystalline bodies, which, from their resisting not only the strongest acids, but also the oxygen flame, he more than intimates are artificial diamonds.

The Isthmus of Suez Canal appears decidedly destined to become a "great fact." Messrs. Bazin & Co., of Marseilles and Alexandria, advertise that as regular transit service by the canals of the Isthmus of Suez is about to be established, they will be shortly prepared to receive and forward goods.

Official information has been received from Madrid of the confirmation of the Royal Order, granting to Major General W. F. Smith, President of the International Ocean Telegraph Company, the right to establish lines of submarine telegraph between the United States and the West India Islands by way of Cuba.

The needle-gun has again been tried at Chalons, and found wanting. About one hundred and fifty of these weapons were put into the hands of the guards, and the commission has reported that these rifles are not suitable to French troops.

Arched floors of concrete, or beton, a mixture of broken stone, sand, and hydraulic cement, are being put down in Paris without any support of vaults, girders, or the like. The material is simply packed in or molded on timber centerings, which are withdrawn when the concrete has "set."

The largest masses of gold ever found were—first, that found at Ballarat, Australia, in 1859, which weighed 224 lbs.; second, that found in Calaveras county, Cal., in 1854, which weighed 195 lbs.

California is becoming a wool-manufacturing, as well as wool-growing country. A company for manufacturing woolen cloths has lately been incorporated at Marysville, and another at Stockton.

It is said that wood can be rendered uninflammable by coating it with a preparation composed of a solution of potash thickened with clay.

Good Steel Pens.—We are using some of Snow's round pointed pens, which give good satisfaction. There are twelve different grades, adapted to every variety of hand. We consider them a superior article, free from the annoyance of scratching, and next to the gold pen for ease of handling. They can be obtained of J. P. Snow, 47 Liberty street, New York City.

HOW GRAIN IS STORED IN NEW YORK.

The influence exerted by the agricultural interest upon the prosperity of the United States can hardly be over-estimated. No other branch of industry has attained such gigantic proportions in so short a time, or wields at present such power for the welfare of the country.

The rise of the great cities of the West, the increased exports, with the corresponding influx of wealth, are each, to a great degree, due to the impulse of agriculture. Chicago, that marvel of progress, is, in itself, a power exerting more of authority on the world's destinies than many a German principality. The unparalleled growth of that city has been owing neither to her manufactures nor foreign commerce, but solely to agriculture and the commerce created by it. A comparison of her grain shipments during the past twenty-eight years, with the increase of wealth and population for the same period, furnishes substantial proof of the above assertion. From less than one hundred bushels in 1838, her exports now exceed fifty-one millions annually. In her position as the converging point through which pass the results of the industry of the entire West, she maintains her proud station, without a rival, as the largest primary grain depot of the world.

When we include the other great cities interested in the grain trade—Milwaukee, St. Louis, Cincinnati, Cleveland, Buffalo, and New York—we obtain a proper estimate of the vast importance of the agriculture of the United States, which not only supplies our own population, but furnishes, in addition, an almost inexhaustible granary for other nations.

The largest port of shipment, as also the largest receiving depot on the Eastern coast, is New York. Through this channel flows the great part of an immense supply on its way to market, either for home consumption or foreign exportation.

During the year ending September 1st, forty millions of bushels of grain were received in this city, of which sixteen millions were exported to England and the Continent. The storage and re-shipment of so large a quantity of grain has caused the erection of immense storehouses in New York and vicinity. We lately visited a model institution of this kind—the United States Elevator and Stores—situated at the foot of Degraw street, Brooklyn, and as the result of our inspection, present the following description:—

The elevator tower is upon the wharf fronting the East River, where there is a depth of water sufficient to float the largest vessels. Here are moored the barges freighted with grain as they arrive from the canals, and ships that are to receive the precious cargo and carry it all over the world. Into the holds of the barges is lowered an endless chain of buckets, properly mounted, technically called the "leg." Power and motion are then imparted by a steam engine, and the unloading proceeds. Raised in this manner from the vessel to a great hight, the grain is emptied into a receiver holding 1,800 bushels. From this receiver it falls upon the scales, where any quantity is easily and conveniently weighed. Raised still higher, having been screened and blown, it is easily reshipped if desired, being allowed to run down through tubes into the ships at the wharf.

When designed for storing, the grain is carried from the scales by the "screw conveyor," a distance of one hundred and seventy-five feet to the main building or storehouse.

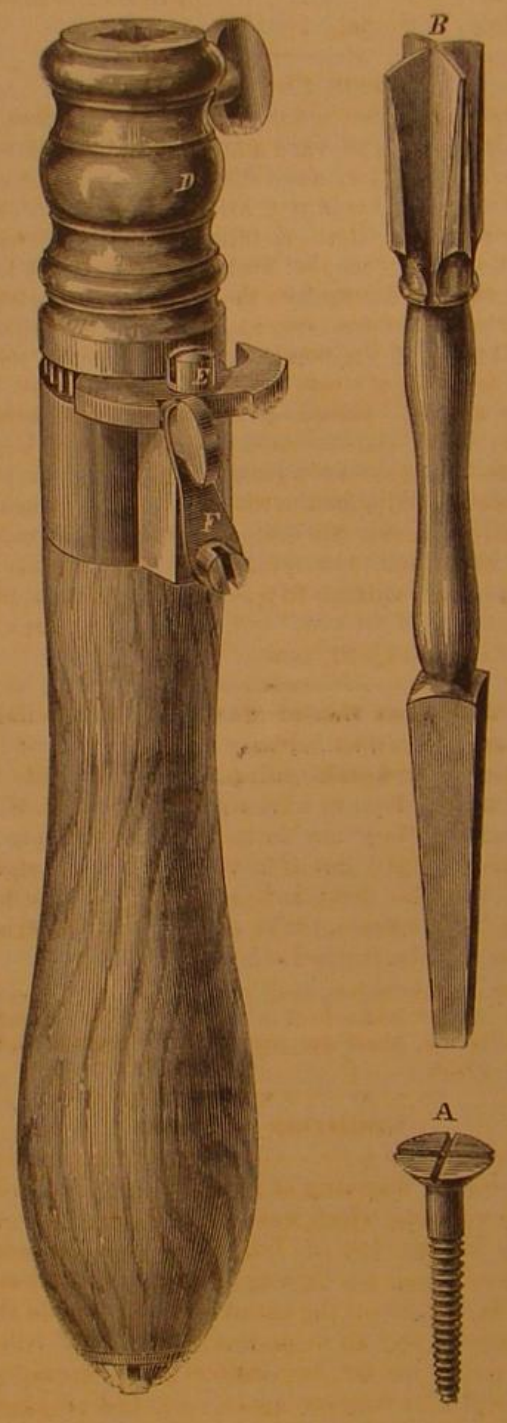
The storehouse is constructed on a new and ingenious plan, for which patents were secured to D. D. Badger, Esq., of this city, through the Scientific American Agency. Ninety-two cylindrical iron tanks, forty-two feet in length, each holding five thousand bushels, placed side by side, occupy the entire building. The intervening spaces between the cylinders, called "angles," have each a capacity for the storage of fourteen hundred bushels, giving a total accommodation for nearly half-a-million bushels. Over the center tank is placed a large receiver, connected to the main building by the "conveyor." From this general receiver, adjustable disbursing pipes are arranged so as to empty into any particular tank or angle, at the pleasure of the operator. By opening a valve in the bottom of each tank the grain may be discharged upon the first floor, and again elevated, if needed, for shipment.

The merits of this mode of storage over that commonly employed are apparent. The building is perfectly fire-proof, and the grain is stored in ninety-two immense iron safes. Economy of space, time, and expense, are other advantages. Under the common method, from eight to ten men are employed in unloading and trimming a cargo. This new plan requires but one man, and the work is performed in a more expeditious and satisfactory manner.

Our reporter is under great obligations to Mr. H. R. Westcott for attentions during our inspection of the establishment.

EVERSOL'S SCREW DRIVER.

The necessity of slipping the hand on the screw-driver, when driving home a screw, and the danger



of splitting the head of the screw when the friction is great, has led to the improvement illustrated in the engraving. If the blade of the common driver does not fit exactly the slot in the screw head, the bearing of the blade is on two opposite corners of the head, the weakest part of the screw, so that not unfrequently the beveled head flies off, breaking at the slot.

The object of this invention is to give a larger contact surface, and double the points of bearing between the driver and the screw; and at the same time to furnish a driver having but one motion. It will be easily understood by the engraving. A is a screw, with cross slots in the head, giving at least four points of frictional contact. B is the blade of the driver, quartered to fit the double slots. It is inserted and secured into the handle, C, as an ordinary bit into a brace. The socket, D, has a shank extending through and rotating in the handle. Connected with the socket, is a ratchet wheel, the teeth, like those of a common gear, which, with the socket and blade, is rotated by means of a pawl pivoted at E, to a knob, or lug, on the ferrule. This pawl turns the socket either to the right or left, as the spring, F, is moved to the one side or the other of the pivot, so that the motion of the hand in turning the handle one way or the other, operates to drive or remove the screw without removing the hand. A familiar illustration of the double pawl can be seen on almost any power planer in a machine shop.

Patented through the Scientific American Patent Agency, Aug. 14, 1866, by Cyrus Eversol, St. Louis, Mo., whom address for further information.

Steam as a Motor.

A correspondent, A. J. H., writes on the navigation of the air, insisting that all that is required to make it a permanent success is a proper motor, which will combine the necessary power with the requisite lightness, and says that steam is that motor. He claims to have made a rivetless boiler, which will bear a pressure of from 1,000 to 3,000 pounds per square inch.

By thus condensing an enormous power he believes aerostation is an accomplished fact, or, at least, is possible. We cannot agree with him that steam, however much super-heated, is adapted to the purpose. The weight of water, fuel, and machinery, to say nothing of the boiler, will be found to be too great, when compared with the mass to be moved in a fluid like air, to have much margin for available power. What is needed, not only for aerostation, but for other purposes, is an entirely new motor, which shall dispense with the weight of a boiler with its necessary appurtenances. The capacity of ships for freight is greatly reduced by the tunnage absorbed by the engines, boilers, and fuel. Machinery we must have to transmit the power from the generator to the element upon which, or through which, the ship moves. But the generator of the steam engine is cumbrous, heavy, and exacting in its demands. That a new motor will, in time, be contrived, without these drawbacks, we have no doubt; but until it is done we have but little faith in economic and successful navigation of the air.

A New Cement.

A late number of the London *Engineer* announces a new cement of great value, which is introduced under the euphonious title "The zopissa iron cement," which, it is claimed, is capable of joining any two solid substances, however dissimilar. Wood, brick, iron, stone, or glass, can be inseparably united with equal facility. A series of experiments witnessed by the *Engineer*, gave the following results:—

Plates of glass were firmly joined, edge to edge; ordinary bottles stuck upon the wall resisted all attempts at separation, till the stone yielded. Champagne bottles cemented bottom to bottom sustained a weight of two hundred and fifty pounds. Two bricks remained joined under a tension of three hundred and twenty-five pounds, till the brick itself fractured, but the cement remained firm. Brick work cemented with this has the solidity of a granite slab.

With paper treated with this preparation in solution, the inventor has made air and water-tight tubes, ammunition cases, coffins, and even constructed a house, one story and a-half in hight, perfectly wind and water-tight, which he now has on exhibition.

Of the constitution of this cement, or the expense of manufacturing it, the *Engineer* makes no intimations.

Imperishable Gut Cord and Belt.

The breaking of the cords of window weights is so frequent that it becomes a chronic annoyance. The manufacture of strong cord of gut has lately been commenced in Williamsburgh by Edward G. Vyse, 33 Grand st., which we can recommend to the attention of builders, house owners, and operators of machinery. The cord is made of gut or raw hide, and will last for sash weights a lifetime. For small round belts also its duration will be much greater than belts made of any other substance. The increased cost bears no sort of proportion to its increased durability.

GOLD has been found in Somers, Mass., specimens of the ore showing, by assaying, over ten ounces or $222,67 per tun.

Correspondence

How to Put a Wood Saw in Good Order.

Messrs. Editors:—I propose to give a few plain and simple directions how to file, and otherwise put in order, the common wood saw, so called, which is so generally used throughout the country for sawing up fire-wood by hand. I have filed wood saws for the community, here, for more than thirty years, and I have endeavored to profit by experience.

I will relate an incident that occurred a few years ago. A gentleman called on me one day, and, in conversation, stated that he had had considerable experience in filing all kinds of saws. I asked him how long it usually took him to file a wood saw; he answered, about half an hour. I told him that I could file one well in ten minutes. He seemed a little incredulous. I told him that I had just as soon file one as not, to prove my statement. I then took a wood saw of common hardness, which I had used for many years, but as the saw was not dull, I took a flat file and jointed down the points of the teeth until the saw was very dull indeed, I then directed the gentleman to take out his watch, which he did, and by it, in just four minutes, I had filed every tooth in the saw sharp and well. This was all the time consumed in filing the saw, but did not include the time of turning the saw over once in the clamp to file both sides.

I will describe the tools, etc., that I use for wood saws. First, a rest on which the saw is laid flat, and to which it is clamped. The rest is made from a piece of two-inch plank about thirty-two inches long, and six inches wide, and it is fastened down to the bench with one edge resting thereon, and the other edge raised, so that the surface of the rest will present an angle, with the bench, of about thirty deg. and slanting from the operator; the rest should be fixed directly opposite a window. Second, I use a six-inch three-corner file, with two handles, one of the handles is fixed upon the point of the file and it is only about two inches long and terminates in a sort of knob or ball at the end so as to be held conveniently with the thumb and two first fingers of the left hand. With two handles to the file, four times as much work can be done as there could be in using but one handle, and the work will be done far better. And, again, the file will do much more work before it is worn out, for it can be safely used the entire length of its cut.

To file the saw it must first be removed from the frame, and if the blank or uncut portions of the saw, at each end, project beyond the points of the teeth, then cut away this part as follows:—Lay the saw on an anvil or block of iron, and with a cold chisel make a cut on one side of the blank part of the saw, and as high up, and in line, with the roots of the teeth. Next, place the saw in the jaws of an iron vise just even with the cut, and with a hammer break off that part above the vise; it is all very easily done. Next examine the saw to see if there are any crooks in the plate, and if so, then place the saw flat on an anvil or other substitute, with the crook uppermost, and strike that part with the pane or corner of the face of the hammer, until the crook is removed. Next, the points of the teeth should be jointed off true and at perfect right angles with the sides of the plate; to do this a tool must be used which is made expressly for the purpose, consisting of a flat file, eight or ten inches long, which is fastened flat to the face of a piece of wood; and to this piece of wood are also fastened two other pieces of wood, each having a face at right angles with the face of the flat file. The depth of each face should be about one and a-half inches, and they should be so close together that the saw will only just pass between them while it is in the act of being jointed. After jointing the saw the teeth should next be set so as to be about twice as wide as the thickness of the saw plate at the back. The saw is now ready to be filed, and is next placed on the rest and clamped down to it with the teeth projecting a little above the upper edge of the rest.

Take the file by both handles and place it against the front side of the first tooth at the left end of the saw. See that the file is placed at the right angle both for the bevel and pitch of the teeth, and when this is right then keep the same position throughout the whole filing. Always file the front side of every alternate tooth first, then file the back side of the same teeth. Then turn over the saw and file the other side in the same way, always commencing at the left end of the saw and work toward the right. Care must be had not to file any tooth any more than just to bring it to a point. Next, if there should be a heavy feather edge left on the teeth, after filing, it should be scraped off with a sharp steel instrument. Next lay the saw flat on a bench and with a straight flat file, placed on the side of the teeth, pass it along over the sides of the teeth once very lightly, this will cause the saw to run *smooth*.

One word about saw frames. I advise all persons to choose a light saw frame, and, by all means, use a cord to strain it up with in preference to other devices.

John S. Dutton.

Jaffrey, N. H., Aug. 21, 1866.

Steam Fire Engines.

Messrs. Editors:—In reply to the solicitation of C. H. H., I give you the performance of one of our steam fire engines, the *Citizens' Gift*. This is the oldest engine in use in our city, and has been in use thirteen years. Time of raising steam, 3 minutes and 40 seconds from the time the torch is applied until water is thrown from the nozzle; size of nozzle, 1¼ inches; distance thrown, 310 feet, measuring from the end of the nozzle to the place where solid water fell; size of steam cylinder, 10 inches bore, 24 inches stroke; pumps, 6 inches bore, 24 inches stroke; double engine cranks at right angles; large air vessels, connected together; length of hose, 100 feet; steam, 100 pounds to the square inch; pressure on water cylinder, 240 pounds to the square inch; speed of engine, 110 revolutions; 220 strokes of pumps; grate surface, 16 feet; heating surface, 560 feet.

Finley Latta.

Cincinnati, Aug. 27, 1866.

Must a Patent Dealer Take Out a License?

Messrs. Editors:—Please inform me if a patentee, or his agents, canvassing for the sale of patent rights, requires a license. B. M.

[A patentee does not require a license simply to transfer a patent. But, if he becomes a patent-right dealer, then he must have a license. So must his agents. The following is an extract from the existing law upon the subject of licenses:—

Patent-right dealers shall pay ten dollars. Every person whose business it is to sell, or offer for sale, patent rights, shall be regarded as a patent-right dealer.—Eds.

Gratifying Success.

Messrs. Munn & Co.—Allow me to inform you of my success in disposing of my patent on my bolt-cutting machine, which was patented through your Agency on the 5th of June last. I commenced operations about ten days ago, by selling one State, and to-day closed out the entire territory. I sold the thing myself, and all to parties in the city of Niles. I shall realize not far from $8,000 in the operation.

You will hear from me again, soon, as I am about making application for another patent.

D. D. Robinson.

Niles, Mich., Aug. 17th, 1866.

Welding Cast Iron and Steel.

Messrs. Editors:—I notice in your column of "Notes and Queries," of the 11th, the query of J. G. B., in regard to welding cast iron and steel, as being practically unanswered. Supposing you desire to answer all such questions, for general as well as for individual information, I take the liberty of giving you the *modus operandi* of putting steel faces on cast iron anvils, or, rather, putting the anvils on the faces.

The plate of steel is highly polished and placed in the bottom of the mold, and dusted with fused borax. The hot cast iron is then poured into the mold, which is so "gated" as to cause it to pass over the plate and out at the other end, until the face is fused, when the escape is closed, and the mold filled.

It takes about three hundred pounds of melted metal to make a two hundred pound anvil. W. H.

Atlanta, Ga., Aug. 22, 1866.

The Maynard Breech-loader vs. Muzzle-loaders.

Messrs. Editors:—I witnessed, recently, a trial of breech and muzzle-loading rifles, which developed some interesting evidence. The distance shot was twenty rods (110 yards), the shooting was from a rest supporting both *ends* of the gun. Globe and peep sights were used on all the guns. A violent north-west wind was blowing directly across the line of fire. Forty strings, of ten shots each, were fired, and no one allowed to see his shots till his string was completed. The muzzle-loaders were none of them over 13 lbs. weight, made by first-class workmen, and provided with false muzzle and starters. The breech-loaders were all Maynard rifles, from 20 to 26 inches length of barrel, none of them weighing over 9 lbs.

No very nice work could be done while such a gale of wind was blowing. The match was won by a muzzle-loader, with a string of 11¼ inches from the center of the bull's eye to the center of each bullet hole. As this, however, is not a test of the comparative powers of the guns, and as these targets afforded a good opportunity of making such comparison, I selected the five best strings shot with muzzle-loaders, and an equal number of the best shot with Maynard rifles, and made very careful measurements of the circles of impact of the ten shots of each, without any regard to the distance from the bull's eye. The following table gives the results in inches, showing, first, the diameter of a circle passing through the centers of the two bullet holes furthest from each other in each string of ten shots; second, the vertical variation, or greatest vertical distance between any two shots; and, third, the horizontal variation or greatest horizontal distance between any two shots:—

Muzzle Loaders.			Maynard Rifles.		
Diam. of circle.	Vert. var.	Hor. var.	Diam. of circle.	Vert. var.	Hor. var.
3 3-16	2 14-16	2 2-16	2 5-16	1 13-16	2 3-16
3 5-16	3	3	2 13-16	2 8-16	2 9-16
3 13-16	1 11-16	3 8-16	3 4-16	2 7-16	2 8-16
3 15-16	2 7-16	3	3 8-16	3 4-16	2 3-16
4 10-16	2 14-16	4 10-16	4 3-16	2 14-16	3 9-16
18 14-16	12 14-16	16 4-16	16	12 13-16	12 15-16

In the aggregate of fifty shots it will be seen that the Maynard breech-loaders are ahead in the circle of shots $2\frac{1}{16}$ inches; in vertical variation, $\frac{1}{16}$th of an inch; and in horizontal variation, $3\frac{5}{16}$ inches.

I have no expectation that any evidence will affect the mind of the "Rocky Mountain Hunter," who replied to a previous communication of mine relating to breech-loaders, and based his denial of their superiority on the fact that he did'nt believe it; but as mere assertion is worth as much in one case as another, I will express my belief that breech-loaders are superior to muzzle-loaders for the very reason he assigns for the reverse, viz., because no patch is used on the ball. H. W. S. C.

Danvers, Mass., Aug. 31, 1865.

A Signal Code.

Messrs. Editors:—A correspondent wants a simple, universal signal code, easily understood and convenient for every body to use. Here it is. Simply learn the Morse telegraph alphabet and the thing is done. It has but two letters by which to spell every word in the language. With a red flag for a dot and a white flag for a dash, signals can be made and understood as easily as operators understand the dots and dashes sent over the wire. Perhaps this idea is original and patentable. If it is, it can be made available. Perhaps not otherwise, as people do not appreciate what they can have for nothing.

Solon Robinson.

New York, Sep. 5, 1866.

An Inefficient Boiler.

Messrs. Editors:—In reading in No. 9, current volume, of the Scientific American, I noticed an article headed "An Inefficient Boiler," and it strikes me that H. M. C. can readily obtain draught enough for his boiler as it is, by simply covering up a part of his grates. We have had a great deal of trouble with a boiler we are now using, through want of sufficient draught. After consulting most of our leading mechanics, it was thought that the square pipe leading from the flues to the smoke-stack was too small. This was changed to a round one twice the capacity of the flues, with the same result. Next, it was concluded the chimney should have twenty feet more, which was done, with like

result. The exhaust was next introduced into the smoke-stack without benefit. In experimenting still further, we one day accidentally discovered the blaze of the fire in the front of the furnace striking down and seemingly coming up in the rear, whereupon we covered one-third of the grates (the rear) with a piece of sheet-iron, and since then have plenty of draught and are obliged to keep the furnace doors closed two-thirds of the time.

JNO. BABILLION.

Detroit, Mich.

The Explosion of Lamps.

MESSRS. EDITORS:—A correspondent of your paper inquires the cause of the explosion of his kerosene lamp. Kerosene lamps are always liable to explode when the tube that holds the wick is not put in right. In soldering it in, the workman usually leaves a small part open for the purpose of admitting air to fill the space in the lamp caused by the consumption of oil. This should never be done. But the tube should be soldered perfectly tight. The air will pass down by the side of the wick, to supply the space in the lamp from the diminution of the oil. Kerosene will explode as violently as alcohol, or spirits of turpentine, or burning fluid, only it requires a little more heat to do it, that is, to raise it into vapor preparatory to exploding. This I show by experiment in every course of lectures I deliver (I am a lecturer in chemistry) when I come to the topic of "burning-fluid and dangerous lamps." It is a great risk to use a lamp for any of the volatile burning-fluids, with an "air-hole," after the manner of the old sperm lamps. N. D.

Newark, N. J., August 23.

Softening Chilled Iron.

MESSRS. EDITORS:—Heat the iron red hot and expose it for a few minutes to the flame of brimstone. If the iron has a flat surface, the brimstone can be placed upon it, where it will burn itself out, leaving the iron as soft as ordinary cast-iron.

MACHINIST.

New Haven, Ct.

Cold Bleaching Process.

M. Tessié du Mothay and M. Rousseau describe very satisfactory trials which they have made of a cold bleaching process, by means of which all textile materials (whether silk, cotton, linen, flax, wool or any woolly fiber) can be bleached. The agent employed is permanganate of soda, slightly acid, prepared by a new and economical process. With this salt, the extraordinary properties of which have of late years been much studied, a bath is prepared, in which the materials to be bleached are dipped. They are stirred about with a glass rod from time to time, and after about ten minutes they are taken out of the bath, strongly colored of a violet-brown hue by an abundant deposit of oxide of manganese. They are then dipped as quickly as possible in a bath of water, acidulated with sulphurous acid, and again stirred and turned over with a glass rod, and after two or three minutes the materials or thread, originally of yellow or gray color, are already white. These operations are repeated twice more, and the result is a brilliant white, while the fibers are in no way injured. The materials operated upon were cotton fabrics, dirty as they came direct from the loom, as well as skeins of linen thread of a dark slate color, which, by existing processes, would have taken many days to bleach.—*Engineer.*

Fire in a Coal Mine.

For the last three months or so Mr. Blyth, mining engineer, has been employed, on behalf of Mr. Dixon, Govan Colliery, prosecuting a bore in search of ironstone on the estate of Sir William Stirling Maxwell, of Pollok. The exact position where the work is being carried on is in a field at an angle of the road leading to Pollokshaws, by Hagboose farmsteading and Haggs Castle, and about midway between these two places. For the last week it has been known to the workmen that gas or fire-damp had been escaping from the bore, and a few days ago they had to extinguish an inconsiderable jet of it which had been accidentally ignited. On Thursday morning a more serious occurrence of the same nature took place. One of the borers had sat down on a tool chest situated about 40 feet from the bore, and proceeded to light his pipe. No sooner was the match struck than he was enveloped in a sheet of flame, but he was only slightly burnt on the hands and face. The fire was conducted to the fountain-head at the bore, and there it was raging on Thursday night, and should no effectual means be found to put it out it is the opinion of skilled persons that it may burn on for a long period—months, perhaps years. When the fire broke out the workmen endeavored, with stout iron rods, which they used as rammers, to stop up the bore, but so strong was the rush of gas that three or four sturdy men were knocked aside. A cast iron boiler, weighing several hundred weight, was then thrown on the top of the flame, but it was instantly rent and tossed into the air. The boring apparatus, having taken fire, had to be torn down and the rods left in the bore, which is 2¼ inches, and has now attained a depth of 420 feet, and passed through the sandstone strata. There is every confidence that the rods will be recovered uninjured on the fire being got under, and it is only on the gas coming to the surface and into contact with the air that combustion begins. The roaring of the flames, which reach from 20 feet to 30 feet in hight, is very loud, and similar to that produced by the letting-off steam from a high pressure boiler. By a telegram from our Glasgow correspondent we learn that the fire died out yesterday, and that means have been taken to prevent the gas being again ignited. The boring operations will be suspended for a day or two.—*Scotsman.*

American Antiquities.

Between the Colorado river and California range of mountains is a vast desert, which, nevertheless, bears evidence of having once been thickly populated. Humboldt, during his researches on this continent, discovered abundant vestiges of a race more civilized and cultivated than any which occupied the country on its first discovery by Europeans. Recently a party of adventurers ascended the Colorado for a distance of about two hundred miles. They found the country on both banks destitute of vegetation, level, and monotonous. On one of the plains they discovered an object, which, after a tramp of five miles, they reached, and found a pyramid of stone laid in regular courses and rising over one hundred feet from the plain, the top presenting a surface of fifty feet square. Evidently a portion of the top had been dislodged, either by the hands of men or some convulsion of nature. The courses of stone were from eighteen inches to three feet in thickness, the outer courses cut at an angle corresponding to the inclination of the structure. The abrading action of the elements had so worn the joints that the ascent was a work of but little labor. By whom and when this pyramid was built will probably always remain a mystery.

War and a Nation's Debt.

War is the most costly enterprise nations can engage in, and war, in these days, is much more costly than formerly. Not to estimate the waste of property, the expense of material and means to wage war now, compared with that of former systems of warfare, is almost incredible. The cost of a single monitor, or ram, is more than that of the fleet engaged at Salamis. The cost of the equipment of one of our army corps in the late war would have sufficed to put on a war footing the army of Xerxes. When George the III. ascended the throne of England, in 1760, the national debt was one hundred and two millions. When he died in 1820, it was eight hundred and thirty-five millions of pounds. In sixty years it had increased seven hundred and thirty-three millions of pounds, or thirty-five hundred and thirty millions of dollars. Almost all this increase was legitimately a war debt. Every invention and discovery in art and science has tended, directly or indirectly, to make war more costly.

Telegraphic Blunders.

The alphabet employed in the telegraph service, has never been recommended on the score of accuracy or reliability. Many of the signs employed are so nearly alike, that absurd mistakes are of frequent occurrence. Mr. Cyrus W. Field, the great telegrapher, was himself lately made the victim of one of these blunders. The following telegram was received from him:—

ON BOARD STEAMER "GREAT EASTERN," Atlantic Ocean, Sept. 4, 1866.

To D. H. Craig, New York.

We have just received telegrams from London saying there is a serious outbreak in *Canada*. Please advise me accurately by cable, via Heart's Content and Valentia, in regard to the same.

CYRUS W. FIELD.

As no news of any Fenian invasion had been received in this city, the foregoing dispatch created no little astonishment until it was explained by another dispatch via London, dated Athens, Greece, stating that an insurrection had broken out in the "province of Candia."

NEW INVENTIONS.

ATTACHING SHOES TO HORSES' FEET.—THOMAS H. INCE, Westminster, London, England.—Patented May 29, 1866.—In this improved mode of attachment, the shoes are fastened to the hoof of the animal by screws, instead of nails, the holes in the shoe forming guides to direct the screws parallel to the walls of the hoof, the heads being countersunk in the fullering of the shoe. We understand that this invention has met great approval in England and Canada, under circumstances very trying to the security of the shoe, and as a matter of safety and symmetry, it is certainly better than risking the puncturing of the quick, and certainly defacing the surface of the hoof.

PIPE WRENCH.—WM. W. WILLS, Janesville, Wis.—Patented May 29, 1866.—This invention consists in pivoting the outer jaw of the wrench to a sleeve, which slides upon the bar, in uch a manner that a firmer grip upon the pipe, or other article to be held, can be attained. The arrangement of Mr. Wills's wrench is such that it is easy in its operation, and very effective in its hold.

APPARATUS FOR PROPELLING STEAMSHIPS.—ARTHUR DOYLE, New York City.—This invention relates to an improved apparatus for propelling steamships, and consists in an arrangement of paddles or buckets which always maintain a vertical position in entering the water, moving through, and rising from it. The dip of the buckets is double or treble that of ordinary paddle-wheels, and may be of any desired depth, presenting in their passage through the water a great area of resisting surface.

FRUIT GATHERER.—WARREN H. STONE, Matherton, Mich.—Fruit growers have long desired some more effectual means for gathering their products, and inventors have not entirely disregarded their wants. Mr. Stone patented, on the 7th of August, a device which consists in combining a flexible apron with a frame so constructed that fruit may be gathered from the topmost part of trees, and conducted through the flexible tube, and lodged upon a canvas apron under the tree without bruising the fruit.

RAILROAD SWITCH.—CHARLES J. BAYER, Poughkeepsie, N. Y.—This railroad switch is in a measure self acting, or may be operated by the car wheels so as to be brought in proper position when the cars are moving in one direction, the switch requiring to be adjusted by hand when the cars are moving in the opposite direction. Its object is to prevent accidents by a careless management of the switch, by having the latter adjusted with certainty by the car wheels.

CIDER MILL.—HUGH SELLS, Vienna, C. W.—This invention relates to a cutting and crushing apparatus whereby the apples may be reduced in an expeditious and thorough manner; also to the construction of a receptacle to receive the crushed apples and in which receptacle the juice is expressed from the latter.

CULTIVATOR.—J. H. BARLEY, Longwood, Mo.—This cultivator belongs to that class which is provided with two laterally-moving plows, and it consists of such construction and arrangement of parts that the plows may be readily operated or moved laterally to conform to the sinuosities of the rows of plants, a strong and durable implement obtained and one which may be manufactured at a small expense.

GUARD ATTACHMENT FOR CULTIVATORS.—THOMAS B. MCCONAUGHEY, Newark, Del.—This invention consists in applying to a cultivator a guard so constructed and arranged as to prevent sods, clods of earth, etc., from being thrown upon the young plants, and obviate the necessity of a person following the cultivator, which is now necessary, in order to uncover the plants covered and crushed down by the ordinary cultivators in use.

PLOW.—GEORGE W. THOMPSON, Ripley, Ohio.—This invention consists in a novel construction of the mold boards and land side of hill-side plows, and in a novel manner of connecting the former to the latter, whereby the mold boards may be very readily turned and adjusted to either side of the beam, and a strong and durable plow, of the class specified, obtained.

FRUIT PICKER.—CYRUS M. LUNT AND WILBUR F. LUNT, Biddeford, Me.—This invention consists in the combination of a sliding rod having tines upon its end with an apron for conducting the fruit into the basket.

ILLUMINATED LETTERS, SIGNS, ETC.—JAMES HARRISON, New York City.—This invention has for its object to furnish improved illuminated letters, etc., by means of which the devices may be rendered clearly perceptible at a great distance when viewed at any angle. And it consists of the combination of glass cups with the letters or devices to be shown, and with the background of said letters or devices.

GRINDING MILL.—CORNELIUS BOLLINGER, Harrisburg, Pa. This invention has for its object the ventilating of the mill stones and it consists of a fan blower on the spindle which forces air up the spindles and distributes it between the stones through the hollow driver, and the air escapes up through the top of the case around the stones.

CORN PLANTER.—ALEXANDER LADD, St. Lawrence, N. Y.—This invention is designed more especially to be applied to hoe handles so as to be used in connection with a hoe to admit of the corn being dropped and covered at one operation.

SPRING BED BOTTOM.—E. R. RISON, Kinmundy, Ill.—This invention furnishes an improved spring bed bottom, simple in construction, strong, and not liable to break or get out of order.

HORSE RAKE.—E. R. HALL, Ilion, N. Y.—This invention relates to that class of horse rakes in which wooden teeth are employed. It consists in a novel manner of hanging and arranging the rake so as to put it under the complete control of the driver, and render it capable of being raised and lowered, and turned in order to discharge its load with the greatest facility.

WHIFFLETREE.—GEO. WATT, Richmond, Va.—This improvement consists in making the double and single trees of rods so fashioned by the bending of one or more portions as to have an elasticity when power is applied to the ends and the middle loop held fast.

BURNING FLUID.—JOHN JANN, New Windsor, Md.—This invention consists of a composition of benzine 33 galons, sweet oil half a pint, and oil of vitriol 2 quarts.

DEVICE FOR LIFTING FLOUR AND OTHER BARRELS.—LUCIUS H. GOFF, St. Albans, Vt.—This invention relates to a novel and useful implement to be used for the lifting of flour and other barrels, whereby it can be accomplished with great convenience and in a most ready and comparatively easy manner.

CAR COUPLING.—GEORGE W. WILSON, Abingdon, Ill.—This is a simple, self-acting device for coupling railroad cars quickly and safely, consisting of an arrangment of cams and levers connected with the bumpers, which release themselves if a car is thrown off the track.

KINDLING MATERIAL.—C. A. ROSE, Columbus, Ga.—This invention consists in preparing a new kindling material by compressing into portable blocks the leaves of the southern pines, which are rich in resin and make a very inflammable and convenient kindling stuff, which can be afforded for less than wood, and opens up a new field of profitable industry hitherto neglected.

CULTIVATOR.—ADDISON F. STILWELL, Fayette, Iowa.—This invention consists in a novel manner of arranging the front plows of the devise, whereby the plows may be adjusted to perform different kinds of work as required.

CONSTRUCTION OF JOINTED MOLDS.—M. B. STAFFORD, New York City.—This is an improvement in jointed molds for brick, peat, soap and other machines for compressing and molding various substances. The object is to obtain a mold of the kind specified which will open freely and close tightly in such a manner as to leave no mark, impression or ridge in the article molded.

GATE.—B. S. HEALY, Cohocton, N. Y.—This invention is designed to furnish a simple, cheap, and convenient manner of hanging a gate.

SAFEGUARD FOR RAILROAD CROSSINGS.—ASA HILL, Provi. dence, R. I.—This improvement in safeguards or barriers for railroad crossings, is to prevent accidents which frequently occur by imprudent attempts to cross the track in front of a passing train. It is simple in construction, capable of being put up at a very moderate expense, and operated or manipulated with the greatest facility.

CATAMENIAL SACK.—JOSEPH C. BENZINGER, Catonsville, Md.—The object of this invention is to produce a catamenial sack which will tend to maintain the person of the patient in a cleanly condition, and will prevent chafing.

WEEDING HOE.—W. J. WELLS, Sidney, Ohio.—This invention consists in a novel construction of a weeding hoe, whereby many important advantages are obtained.

CORN PLANTER.—BARNABUS CLARK, Mackinaw, Ill.—This machine is for planting corn in hills or check rows without any previous furrowing of the ground. Its object is to obtain a simple device for the purpose, and one whose parts will be under the complete control of the driver or operator, and be capable of being rendered operative and inoperative, when desired, with the greatest facility.

ROCK-DRILLING MACHINE.—GEORGE F. UNDERHILL, Brooklyn, N. Y.—This invention consists principally in a novel arrangement of parts for operating the drill of the machine.

HOLDING DRIVING REINS.—MILTON WHIPPLE, Medina, N. Y.—This invention consists in a device composed of a vibrating spring attached to a bed plate, between which spring and plate the reins may be readily inserted, and thereby held and prevented from getting under the horse's feet or otherwise entangled while the driver temporarily leaves the carriage.

MACHINE FOR BORING AND TENONING.—JAMES LEFEBER, Cambridge City, Iowa.—This invention consists in a combined boring and tenoning machine, adapted especially for the manufacture of wheels of carriages and other vehicles. It is also calculated for finishing or completing the wheel thereon, so that it need not be removed until it is finished. The fellies can be doweled thereon by placing a doweling table on the machine.

CLOTHES DRIER.—J. C. CONNOR, Dover, N. H.—This clothes drier is light, simple in construction, cheap, and occupies little space either when folded or when open; and which at the same time is strong, affords a large amount of drying surface, and allows a free circulation of air among the suspended clothes.

ATTACHING KNIVES TO THEIR HANDLES.—WILLIAM CLAYTON, Bristol, Conn.—This invention consists in passing the tang of the blade through the handle of the knife and securing it at the rear end of the handle by a nut, which screws on a screw thread cut on the end of the said tang, by which means the knife is made strong and firm; and it possesses the quality of being fastened without the use of cement or rivets, and produces a neat and comely-appearing article of cutlery.

EARTH SCRAPER.—NELSON PECK, Jay, N. Y.—This is an improved scraper for moving earth from one place to another in making and repairing roads, and for other purposes.

FENCE.—GEORGE S. CARLISLE, Columbus City, Iowa.—This invention consists in attaching braces to each other and to the ends of the adjacent panels of fence, for the purpose of firmly sustaining the fence, and at the same time enabling said fence to be readily removed and again set up in any desired situation.

SAFETY WHIFFLETREE.—W. A. HARRALL, Washington, Ind.—This invention has for its object to furnish an improved whiffletree, by means of which the horse may be released from the carriage whenever he becomes so unmanageable as to render it advisable.

MACHINE FOR BORING WELLS, ETC.—COLIN MATHER, Manchester, Eng.—This invention relates to a machine for boring wells or other holes in the ground, in which a flat drill rope or band is used, in contradistinction to the ordinary round rope and metal rods, the drill being arranged in such a manner that it makes a part of a revolution after each blow. The drill rope extends over a pulley which is secured to the top end of a piston rod, to which a rising and falling motion is imparted by the action of steam on a piston fitted into a suitable cylinder.

DRILL FOR BORING WELLS, ETC.—COLIN MATHER, Manchester, Eng.—This is a drill the cutting part of which is composed of a series of flaring cutters or chisels, secured in a suitable head in such a manner that a hole of considerable diameter can be bored, and that the cutter can be readily kept in order, each of the chisels being made so that it can be removed independent of the others, and sharpened or replaced by a new one at short notice, and with little loss of time or expense.

PORTABLE RAILROAD.—JOHN W. PETELER, Sheppach, Bavaria.—The object of this invention is a portable railroad, which can be readily transported from one place to another, and easily put down or taken up, and which can be used with great advantage for passing over marsh land, for building roads, or for engineering or building operations in general.

LOOM.—ISAAC N. HODSON, Mount Pleasant, Iowa.—This invention consists in the arrangement of a grooved roller, to which an oscillating motion is imparted by the action of a suitable toe or tappet attached to the lay or batten, and which are provided with double, triple or multifarious cranks intended to impart the required rising and falling motion to the heddle frames, in such a manner that two or more heddle frames can be operated by the motion of the batten, and the construction of the loom is materially simplified.

CHURN.—JACOB H. MENDENHALL, Cerro Gordo, Ind.—This invention has for its object to furnish an improved churn, easily and conveniently operated, and which will do its work quickly and thoroughly.

WAGON OR CARRIAGE GEARING.—J. R. MCALISTER, Richville, N. Y.—In this invention the reach-pole is dispensed with, and the wagon body is connected with the front and rear axletrees by means of four or more trace rods, in a novel and peculiar manner, whereby strength, durability, lightness, and cheapness are secured, and the pitching, either backward or forward, of the wagon-body is entirely prevented.

TELEGRAPH INSTRUMENT.—ALONZO CHASE, Syracuse, N. Y.—The object of this invention is to enable persons who are not skilled in or acquainted with the system of telegraphing to signal any message over the wires of a line of telegraph.

BAG HOLDER.—GILBERT E. CORBIN, St. John's, Mich.—The object of this invention is to produce a bag holder that will be susceptible of adjustment to any of the varying sizes of the bags.

ORGAN REED.—A. M. BRUSH, Clayton, N. Y.—This invention consists in the use of silver in the manufacture of organ and other similar reeds, whether alone, or mixed, or alloyed with other metals.

COMBINED TOILET STAND AND MIRROR.—W. H. HUGHES and H. L. LENT, Peekskill, N. Y.—This invention consists in combining with a toilet stand a mirror, in such a manner that its height from the top of the stand can be adjusted to suit the wishes of the person who is using it, and according as may be deemed necessary.

DIES FOR HEADING BOLTS.—JOHN W. SIBBET, Cincinnati, Ohio.—The object of this invention is to furnish dies for heading bolts of any size or length, having heads of any desired shape, and square or round necks; and it consists of improved dies formed in parts, and in the combination with the said dies of headers for forming the heads.

CLOTHES-WASHING MACHINE.—M. J. LOWRRENTZ, Leavenworth, Kansas.—This invention is for washing clothes, and consists in a novel construction and arrangement of parts, whereby clothes may be thoroughly cleaned without injury and with but a moderate expenditure of power.

SCHOOL DESK AND SEAT.—GEORGE MUNGER, New York City.—This invention relates to a school desk and seat, which is constructed of a number of pieces joined together by dovetails or flat tongues and grooves, so that the desk or settee can be readily taken apart and packed in a comparatively small compass, and when it is to be used it can be put up by any person of ordinary mechanical skill without much loss of time.

HYDROCARBON VAPOR MACHINE.—JAMES F. SPENCE, Williamsburgh, N. Y.—This invention relates to a hydrocarbon vapor apparatus, in which two air wheels are used, working in one and the same case, and operating in combination with said case in such a manner that a steady light is produced without the aid of a gas receiver. The supply oil vessel is provided with a jacket to receive steam or hot air, in such a manner that the oil is heated before it is admitted to the machine, and the formation of the illuminating mixture is considerably facilitated. The hot air is generated in a chamber attached to the machine, and heated by a burner supplied with gas from the machine. The quantity of oil contained in the machine is regulated automatically by a float, carrying a stop valve, which closes the mouth of the feed-pipes as soon as the liquid in the machine has reached the desired hight.

SAND PUMP.—COLIN MATHER, Manchester, England.—This sand or shell pump is provided with a cylindrical barrel similar to that of an ordinary pump, and provided at its lower end with a valve or clack opening upward, somewhat similar to that in ordinary pumps, but instead of being fastened to the cylinder, its seating is in an annular frame, which is drawn up against the end of the cylinder by a rod passing up to a wrought iron guide or bridge at the top, where it is finally secured by a cotter or key.

HOOP-SHAVING MACHINE.—J. G. MORGAN, Colton, N. Y.—This invention has for its object to furnish an improved machine, by means of which hoops may be shaved conveniently, quickly, and accurately.

ELECTRIC BATON.—R. G. PIKE, New York City.—This invention relates to a contrivance for lighting gas by electricity, which may be considered in two parts, viz: the electric baton and the deflector, the former being the generator of the electric spark, and the latter the means to bring said spark properly in contact with the gas.

APPARATUS FOR RECEIVING, DISCHARGING, AND TRANSFERRING FREIGHT, ETC.—NEWTON A. PATTERSON, Kingston, Tenn.—The object of this invention is to furnish an improved apparatus for receiving and discharging freight from railroad cars and vessels, and for transferring it from one place to another, whether it be about the depot, about the wharf, or in any other place.

BED CHAIR.—E. HAMBUJER, Detroit, Mich.—This invention consists of an improved bed chair formed by combining the back seat, cushion, and legs with each other and with the frame of the chair, in such a way as to furnish an easy chair, which may be readily converted into a comfortable bed.

NECK TIE.—JAMES K. P. PINE, Troy, N. Y.—This invention relates to a substitute for the ordinary neck ties, and consists in making them of paper, card-board, or other similar materials and ornamenting them with any suitable design, in imitation of the ordinary neck ties, etc.

FENCE.—CHARLES LEE, Winchester, Ohio.—This invention has for its object to furnish an improved fence, light, strong, and durable, and which may be easily and quickly put up and taken down, and consists principally in the cast-iron flanged loops in combination with the posts and boards of the fence.

Notes and Queries

Watchmaker, of Mass.—The superior finish of the steel work in English watches is simply the result of patient labor. Oil stone dust, crocus, rouge, Vienna lime, etc., are the materials used, applied by means of block tin, glass plate, or boxwood. They finish by hand and we by machinery.

L. G., of Pa.—Lathes built by the best makers always have a belt guard at the rear of the small pulley of the cone. If your counter-shaft is in line with your head arbor, and you use both hands in shifting the belt, there is no necessity of tearing the belt in the gear. The destruction of belts you speak of is simply the result of culpable carelessness. We have used lathes for many years without injury to the belts.

E. H. S., of Ohio.—Galvanizing, probably to suit your purpose, can be effected by cleaning the iron with acid, sulphuric or hydrochloric, and water, and plunging it in a bath of melted zinc. The deposition of the zinc by means of the galvanic battery is more effectual, but more costly and trouble some.

J. D. S., of——.—Gun barrels are blued by heating in a charcoal fire. Packing them in boxes with sand before going into the fire insures a more even color.

A. M. S., of N. Y.—We know of no way to blue iron or steel without heating except by a lacquer.

L. M., of Mass.—Nine-ninths is a unit and not a fraction. Written 9-9 it may be technically considered fractional, but is so only in form. One hundred is no more a fraction when expressed thus: 99 9-9 than when expressed as 100.

J. H. F., of N. Y.—There is no particular reason except that of convenience in placing a beam engine of a steamboat fore or aft the shaft. It will work equally well in either position.

Mechanic, of Ohio.—Send to Henry Carey Baird, 406 Walnut street, Philadelphia, and he will furnish you what you need for the study of draughting.

H. C., of Mass.—There are conflicting statements as to the shortest trips to Europe by steamers and sailing vessels. We cannot afford the time to study and decide the question you ask.

E. H. L., of Mo.—Bleaching powder is not manufactured in the United States, and the manufacture is profitable only where extensive alkali works are in operation. The oxide of manganese is not mined in this country. One of the most valuable mines of chrome iron in the world is found in the State of Maryland.

W. A. K., of Ohio.—An alloy of zinc and iron can be made by any one of the methods used for making brass, substituting the iron for the copper. But as the melting point of the iron is higher than that of the copper, the difficulties will be greater. We are not aware that such an alloy is used in any of the arts.

D. P., of Ohio.—Silicate of soda has the same properties as silicate of potash, and a solution of it is an article of commerce under the name of liquid quartz. You can buy a small quantity cheaper than you can make it.

N. D., of N. J.—The highest authorities in chemistry have adopted the changes in the nomenclature, and use such expressions as sulphate of sodium, carbonate of calcium, etc. The school books are not the best sources for the latest progress of science.

SPECIAL NOTICES.

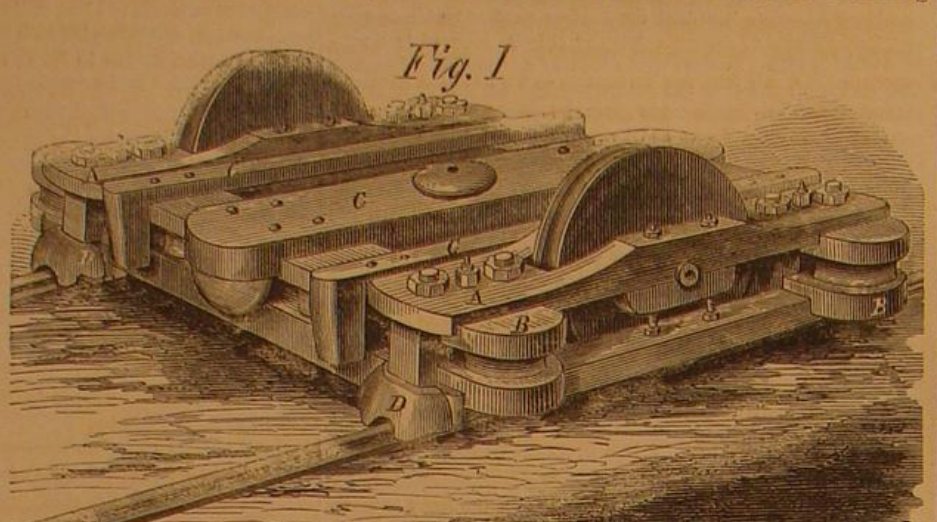
John R. Moffit, of Chelsea, Mass., formerly of Piqua, Ohio, having petitioned for the extension of a patent granted to him on the 30th day of November, 1852, for an improvement in grain separators, and reissued on the 17th day of May, 1859, in three divisions—A B and C, numbered respectively 715, 716, and 717—this petition being for the extension of the reissue, B, numbered 716, it is ordered that the said petition be heard on Monday, the 12th day of November next.

Improved Suspension Car Truck.

Cases have been known where a train of cars has been lifted bodily from the track by a tornado, and accidents have occurred which were attributed to the top-heaviness of cars, owing to their elevation from the track and the narrowness of their bases in the spread of the wheels. This improved truck is intended to bring the weight of the car nearer the track than is possible in the ordinary truck, to facilitate the ingress and egress of passengers, the loading and unloading of freight, to admit of the use of wheels larger than those commonly employed, and to allow independent action of the wheels on either side of the car.

Fig. 1 is a perspective view of a single truck. It will be seen that the body of the truck is suspended beneath the center of the axle, thus bringing the car bottom so much nearer the rails. The wheels run in brackets, A, which are connected by double cross-ties, B. Between the upper and lower portions of the cross-ties, springs of rubber, or other suitable material, are interposed, and the whole frame is braced and made solid by longitudinal ties, C. The rubbers, D, are intended to run near the rail for the purpose of clearing obstructions from the track, and securing the cars on the track if by any means the wheels should be lifted from their places. To further secure this object, the wheels can be made with a light outer lip, as shown in the engraving. This is practicable in this truck, as the wheels move independently of one another on short axes.

Fig. 1



STRAIT'S SUSPENSION CAR TRUCK.

With these trucks the cars can fall but a short distance in case of collision, or running off the track. Larger car wheels may be used with greater speed and safety than with the ordinary truck, as the weight is suspended so near the rails. The truck may be attached to the car in the usual way or so that the wheels may work in wheel houses inside the car or in recesses outside, so that the car may be made wider, or consist of two stories. It is claimed that the wheels, being on independent axles, are subjected to much less wear and tear in rounding curves than where both of a pair of wheels are secured to the same axle. Patented May 22, 1866, by H. Strait, 66 East Pearl street, Cincinnati, Ohio, whom address for further information.

Fig. 2

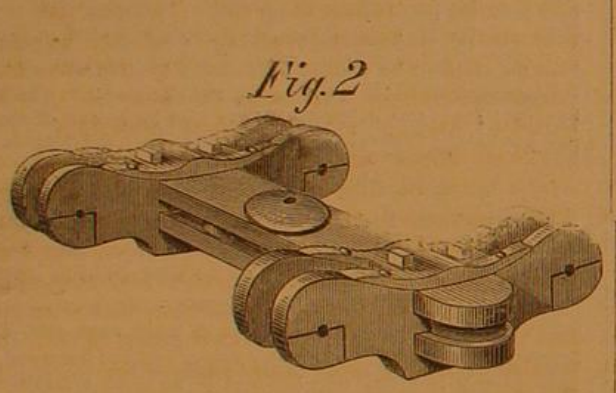


Fig. 3

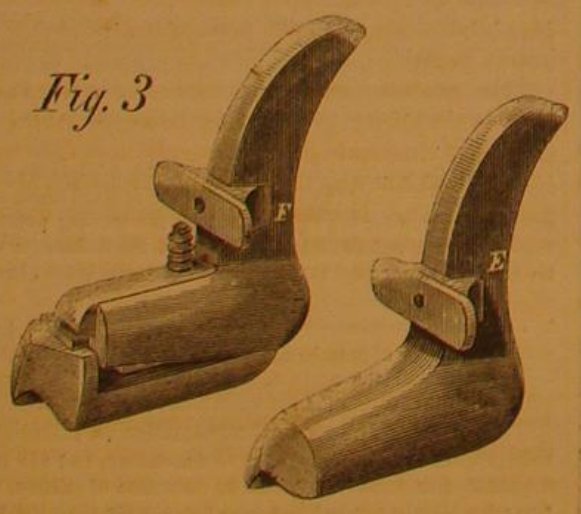
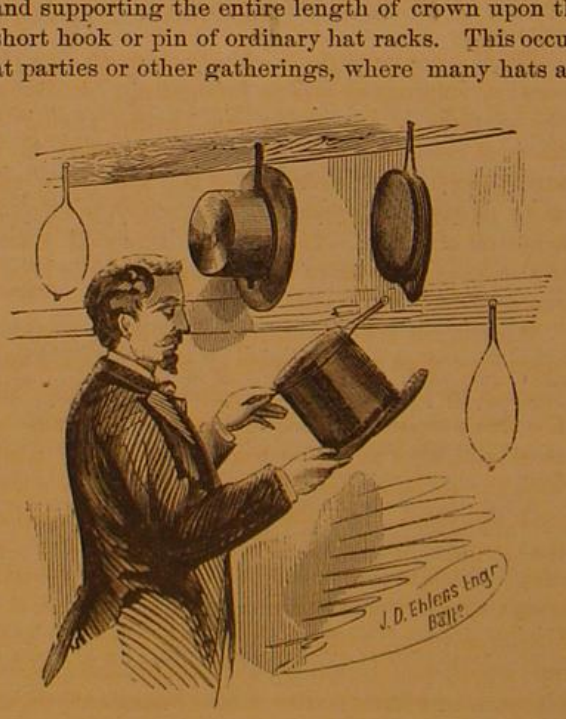


Fig. 2 shows a double truck intended for four wheels. Its plan of construction will be readily understood by the engraving without reference to its parts. Fig. 3 represents rubbers or guides to be attached to the double truck, projecting in front and in rear of the wheels. E is a fixed rubber at the rear of the wheel, and F an adjustable rubber, which can be raised or lowered at will by means of a bolt and spring.

KEENER'S PATENT HAT RACK.

Gentlemen are often much provoked by having their fine and costly silk and fur hats tumbled about the floor on account of the difficulty of balancing and supporting the entire length of crown upon the short hook or pin of ordinary hat racks. This occurs at parties or other gatherings, where many hats are crowded together, or in hotels, private houses, offices, and elsewhere, and, as a result of such rough usage, many a valuable hat does not live out half its days.



The annexed engraving shows Keener's patent elliptic hat rack, which is designed to obviate this difficulty. In the place of the old form of hat hook, he supplies an elliptic ring or loop of metal or other material; this is suspended from an eye or hook. In using it, the ring is lifted to a horizontal position with one hand by means of a slight finger piece at its lower end, while the crown of the hat is inserted in the ring from below. The ring is then dropped to its pendent position, holding the rim of the hat against the wall or rack frame, as shown in the engraving.

Thus secured, it is impossible for the hat to fall of itself; it matters not how high the crown may be, it is safe. This form of rack may also be used for ladies' or misses' hats and bonnets, boys' caps, etc. If it is desirable to use it in connection with the old hooks for coats, the rings may be so placed as to bring the hooks in their center; by this means the coat may be hung under the hat. This patent was obtained through the Scientific American Patent Agency. As the patentee is not prepared to manufacture these racks, he will sell the rights. [See advertisement in another column.]

HARLOW'S ASH SIFTER.

The old-fashioned wood fire, although having its inconveniences, is free from the plague of ash sifting and its attendant annoyances of dirt and labor. We have yet to see the person fond of poking the fire, who is equally enamored of sifting coal ashes. Economy, however, demands that ashes should be sifted, and he who can provide the means of doing the work effectively, divorced from its annoyances, is entitled to the thanks of the housewife. This is the intention of the improvement herewith illustrated.

It is a box containing a cylinder, A, of wire gauze which is rotated by a crank. The cover has a small trap, B, which is opened to admit the introduction of the mixed coal and ashes, the cylinder being held by the pawl, C, so that the opening, D, is retained opposite the trap. A partition, extends across the drum from the center to the periphery, and a door, E, pivoted on the central shaft closes the aperture. This door is secured by a button, seen at F, held by a spring. The lug, G, fastened to the inside of the case, turns this button and opens the door, E, at each revolution, and it is closed again by its own weight after passing the center. This arrangement tends to throw the ashes from side to side until they are thoroughly sifted, while the position of the door, when open, prevents the escape of either ashes or coal from the cylinder. When properly sifted the pawl, C, is lifted, the cylinder turned to the left, and the coal is dumped through the shute, H, into a hod. The contrivance is easily secured to the top of a barrel which receives the ashes and prevents them from escaping.

Patented through the Scientific American Patent Agency, April 24, 1866, by P. Harlow, Kingston, Ulster Co., N. Y., whom address for additional information.

REMARKABLE PASSAGE.—The English papers notice the fact that during the run from New York to Brest, the *Pereire* exceeded the *Ville de Paris's* run, the voyage being of extraordinary quickness, the distance from New York to Brest, which is 26 miles further from New York than Liverpool, and 225 miles further than Queenstown, being accomplished in eight days and 22 hours, giving an average speed of 14 knots an hour—a rate of steaming without parallel.

PAPER, as well as cotton fabrics, can be rendered partially fire-proof by immersion in a solution of alum.

THE

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.

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

☞ "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.

VOL. XV., No. 12, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, SEPT. 15, 1866.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Fancy Loom	179	The Explosion of Lamps	184
Twenty-five Years—A Retrospect	180	Softening Chilled Iron	184
Williams's Theory of the Diffusion of Steam	180	Cold Bleaching Process	184
Moire Antique	181	Fire in a Coal Mine	184
The North Pole	181	American Antiquities	184
Improvements going on South	181	War and a Nation's Debt	184
Sawing Lumber	181	Telegraphic Blunders	184
The Change of Leaves	181	New Inventions	184
Miscellaneous Summary	181	Notes and Queries	185
How Grain is Stored in New York	182	Special Notices	185
*Eversol's Screw Driver	182	*Improved Suspension Car Truck	186
Steam as a Motor	182	*Keener's Patent Elliptic Hat Rack	186
A New Cement	182	*Harlow's Ash Sifter	186
Imperishable Gut Cord and Belt	182	The Recovery of the Cable of 1865—Deep-water Fishing	187
How to Put a Woodsaw in Good Order	183	Fumigating	187
Steam Fire-engines	183	Rancid Butter for Cooking	187
Must a Patent Dealer take out a License?	183	Preservation of Wood Against Decay	187
Gratifying Success	183	American Steel	187
Welding Cast-iron and Steel	183	Patent Claims 188,189, 190, 191,	192
The Maynard Breech-loader vs. Muzzle-loaders	183	Advertisements	192, 193
A Signal Code	183	*Improved Wood-bundling Press	194
An Inefficient Boiler	183	*Patent Earth Borer	194
		What is Metal?	194
		Securing Lumber on Wagons	194

THE RECOVERY OF THE CABLE OF 1865---DEEP-WATER FISHING.

One of Joe Miller's Irishmen carelessly let the tea-pot go overboard. His wit, it is said, saved him from the punishment which he otherwise would have deserved. After the captain had admitted that if he knew where a thing was it could not be considered to be lost, Pat was emboldened to assure the captain that his "taypot was at the bottom of the say." But the wit of this is greatly tarnished by a recent exploit at sea. We shall now need some new theory, and a better proverb than "a needle in a haystack" to convey a notion of what we consider impossible.

The exploit to which we refer is the recovery of the Atlantic cable which was lost at sea August 2, 1865. At the time of the parting of the cable, twelve hundred and thirteen miles had been paid out, and the many attempts then made to fish up the end and make a splice were fruitless. The new fishing expedition sailed with the *Great Eastern* on August 9th; on the 12th all was ready and the dragging the bottom of the ocean with grappling tools commenced; on the 17th the cable was brought to the surface and was greeted with cheers, but the rejoicing was only for a moment—the cable quietly slipped from its fastenings and sank again to the bottom of the sea. Three times was this success, ending in failure, repeated. But on the 26th, the cable appeared for the fifth time, and a permanent union was made with the coil on board the *Great Eastern*. An examination showed it had not been injured and was in perfect working order. It carried the good news to Valentia, which, in a few minutes, was returned to America. Since its recovery the cable has been in constant use. Cyrus W. Field, who was one of those with the expedition, asked the news from home by way of Ireland!

This, to our mind, is one of the most admirable engineering feats of the day. To think of finding the exact spot on the pathless ocean, and then from the bottom, two miles down, picking up a slender wire! It is only the science of the nineteenth century that could accomplish such an undertaking.

THE process of grinding the speculum used with the Rosse telescope occupied six weeks. A small steam engine furnished the motive power for the operation.

FUMIGATING.

The ancient Greeks, children as they were in science, and especially in chemical science, had, nevertheless, discovered that certain substances have the power to promote putrefaction; and this property they expressed by the word *septikos* from their verb *sepo*, to putrefy. Hence the word antiseptic to express the property of preventing putrefaction.

Since it has been ascertained that yeast and other substances which promote fermentation are growing plants, which are propagated by means of minute seeds or germs, it has been supposed that some, at least, of the antiseptics operate by killing these germs. Of all known substances the two which are most efficient in the destruction of septic germs are carbolic acid and sulphurous acid. Carbolic acid has been recently described in these columns; it is one of the many useful and wonderful substances that are produced when bituminous coal is subjected to destructive distillation. Sulphurous acid is the substance usually employed in fumigation, especially when fumigation is resorted to as a means of preventing the spread of cholera.

The advantage of sulphurous acid for fumigating is, that at ordinary temperatures it exists in a state of gas; consequently it diffuses itself throughout a house or apartment, and enters every crevice in the walls and ceilings, as well as every crack in the floors. Nothing could be more searching, thorough, and efficient in its operation. It destroys not only all septic germs, but also all kinds of animal life. When a house is filled with it, every rat, mouse, cockroach, and bedbug must flee from the premises or be instantly destroyed.

Sulphurous acid is composed of sulphur and oxygen, in the proportion of one atom of sulphur to two of oxygen ($S O_2$) and as the atom of sulphur weighs twice as much as the atom of oxygen, the proportion by weight is pound for pound. It is produced by the simple process of burning sulphur in the air. When the temperature of sulphur is sufficiently raised it enters into combination with the oxygen of the air in the proportion to form sulphurous acid.

There are some serious objections to the employment of sulphurous acid in fumigating. It clings to the surfaces of the walls, and nestles among the fibers of clothing, and, when thus exposed to the atmosphere, each molecule, $S O_2$, absorbs a third atom of oxygen, becoming $S O_3$, which is sulphuric acid—oil of vitriol. This liquid, it is well known, is almost as destructive to clothing and other organic compounds as fire itself.

Were it not for this objection, nothing would be more easy than to rid vessels of rats and other small animals by burning a little brimstone in the hold. For this purpose carbonic acid would be equally efficient, and, after doing its work, it would all mingle with the air in its gaseous state, and be blown away with the wind. But the sulphurous acid produces that peculiar irritating effect upon the nostrils and lungs which is perceived in the burning of a friction match, and it would cause rats and mice to flee before its advance, while carbonic acid, being inodorous, would quietly kill the animals in their lurking places, where their bodies might become offensive in decay.

From the recent report of Dr. Elisha Harris, the learned Registrar of the Board of Health, it seems to be the general conclusion of chemists and physicians in Europe and America, that, by means of carbolic acid and sulphurous acid, both of those awful scourges, the rinderpest and the cholera, may be as completely controlled as small pox is by vaccination. This power of carbolic acid is one of the most beneficent discoveries of this fruitful century.

RANCID BUTTER FOR COOKING.

Many persons sneer at the common notion that butter too rancid to be eaten raw upon bread, may be used without objection in cooking; but this notion, like many other popular ideas, is more in accordance with the truth of the matter than the imperfect knowledge which ridicules it.

All fats are compounds of acids with glycerin. Butter is a mixture of several fats, and one of them, constituting, however, only a small portion of its mass, is butyrine; this is a compound of butyric acid with glycerin. Butyrine, like other fats, is a neutral substance, but when it is decomposed—in other words, when the butyric acid is separated from the glycerin with which it is combined—we then have the two substances, the acid and the glycerin, exhibiting each its peculiar properties. Butyric is a very powerful acid, caustic and sour, and having that peculiar strong odor which is characteristic of rancid butter. One of the early steps in the decay of butter is the decomposition of the butyrine, which is made manifest by the odor of the butyric acid set free, and by the sour and biting taste of this acid.

Now, at a temperature of 315 degrees, butyric acid is evaporated, hence it is only necessary to raise the temperature of the butter to this point in order to drive off the acid which makes it rancid, and to leave the remainder perfectly sweet. If rancid butter is mixed in cake, a portion of the butyric acid will be absorbed by the water in the cake, and it may not be all expelled by the heat in baking; but if the butter is used for frying in an open pan, it is pretty certain that the butyric acid will all be evaporated. With a knowledge of the properties of butyric acid, a skillful cook ought to be able to use rancid butter in such ways as to retain none of the rancidity in the cooked articles.

Preservation of Wood against Decay.

A correspondent furnishes us an interesting article on the above subject, which want of space this week obliges us to condense. We merely give the important parts. After speaking of the advantages of charring wooden posts before setting, he says:—Scientific men have explained this superiority to reside in the peculiarity of charcoal for absorbing the gases arising from decaying substances. But charcoal retains this property but a short time unless kept from the air. The reason of this lies in its limited absorbing power. In less than twenty-four hours after being set, the charcoal becomes saturated, and is then entirely ineffective for protecting the wood. The cause of the preservative influence must then be sought elsewhere, and the following is my belief:—The microscope reveals the cause of decay as due to parasites feeding on albuminous substances. Dr. Schmoele gives the following conditions, all of which must be fulfilled before decay takes place: The presence of parasites or germs, albuminoids, moisture, free oxygen, together with a suitable temperature, and the absence of greater counteracting influences. Now, charring wood dispenses with the first two conditions, for the heat required to char the outside coating is more than sufficient for decomposing the albuminous substances, and destroying all parasitic germs. A temperature but little above the boiling point would answer for this equally well. I come then, to the conclusion, that, for preserving wood, charring is quite superfluous, a much less heat answering equally well. On this idea, original I believe with myself, and which I claim as my invention, I base my plan for the preservation of wood. I propose to store the timber, of whatever description, in large stone or iron boxes or rooms through which I circulate currents of hot air or superheated steam, till each piece is heated to the required degree.

This process offers the following advantages: greater simplicity, greater cheapness, requiring no expensive chemicals, greater expedition of the work.

As is well known, the albuminoids are highly hygroscopic, and in consequence expand or contract with every change of moisture in the air. Wood treated as above is no longer subject to such changes.

American Steel.

A correspondent from Newark, N. J., complains of American steel as not being uniform. He claims that we have in this country as good material for making good steel as is to be found anywhere. But the same advertised qualities differ in a single case of the steel. Some of it is so hard that it will not bear more than a dull red heat, and then, when hardened, will break when driven into a piece of hard wood. There is no reason, except want of care and a proper knowledge of working steel, why we cannot make as uniform a quality of steel as is made in England. Success will come with patience and perseverance. We do not despair of seeing good American cast steel.

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING SEPT. 5, 1866.

Reported Officially for the Scientific American.

☞ 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.

57,656.—HANDLE FOR BRUSH.—Albert Alden, New York City.

I claim the sleeve, B, which slides on the upper part of a handle, in combination with one or more notches, c, in the top edge of the lower hinged part, A, of said handle, constructed and operating substantially as and for the purpose described.

57,657.—AXLE BOX.—Samuel F. Allen, Chicago, Ill.

I claim, First, Securing oil cellars in place in their boxes by means of removable bottoms, which are constructed and applied substantially as described.

Second, The combination of the fixed pin, h, and the jam nut, with the hinged plates C C, and a suitable cushion, which is interposed between said plates and the bottom of the oil cellar, substantially as described.

57,658.—CAR COUPLING.—John Bailor, Cannon City, Minn.

I claim the application to railway car couplings of wheel springs, swivel links, or shackles, in combination and as herein described, and for the purposes specified.

57,659.—WOVEN FABRIC.—Seth W. Baker, Providence, R. I.

I claim the fabric above described, produced by combining, by means of the mode of weaving described, the body of the fabric formed wholly of cotton or linen, with a face or surface, the weft of which is woolen and which is interwoven with said body or central portion on one or both sides of the same, in the manner and for the purpose set forth.

57,660.—CULTIVATOR.—J. H. Barley, Longwood, Mo.

I claim the iron bars, D D, attached to the plow beams, A A, to support the cross piece, E, a suitable distance above the plow beams, in connection with the plow standards, F F, pivoted to the cross piece, substantially as and for the purpose specified.

I further claim the curved handles, K K, pivoted to the adjustable bar, J, and connected to the bars, F, which are pivoted in the bar, H, and secured to the plow standards, F F, substantially as and for the purpose set forth.

57,661.—RAILWAY SWITCH.—Charles J. Bayer, Poughkeepsie, N. Y.

I claim the connecting of the switch rails, C C, to the main and branch rails, A' B', by means of the bars, D D, substantially as shown, so that the switch rails will be adjusted or moved by the action of the car wheels on the bars, D D, as described.

In a railway switch, adapted to operate substantially as herein described, I further claim having the adjoining sides of the rails, A' B', and the bars, D D, beveled or inclined to form a lock for the bars, D D, as set forth.

57,662.—KNIFE AND FORK.—Frederick C. Beach, Stratford, Conn., and Alexander A. C. Klaucke, Washington, D. C.

We claim the combination with a knife or fork, of a receptacle for pepper, salt, or other condiment, in any manner, substantially as herein described.

57,663.—SOAP.—S. T. Beeler, Wales, Ill.

I claim the manufacture of soap by the combination of the ingredients in the proportion and manner substantially as herein specified.

57,664.—COUPLING JOINT FOR WELL-BORING SHAFTS.—L. Harrod Bell, Carmichaels, Pa.

I claim the device for preventing the two sections from separating by becoming unscrewed, namely, the mortises, h and i, bolt, D, and spring, E, all arranged and operated substantially as set forth.

57,665.—CATAMENIAL SACK.—Joseph C. Benzinger, Catonsville, Md.

First, I claim the expanded flap, M, extending backward from the trough of the sack so as to cover the nates and carry the straps, W W, beyond that part of the person, substantially as set forth.

Second, I also claim the sack made substantially as described, with a flap, M, and a trough, N, in combination with an elastic girdle, substantially as described.

57,666.—ARTIFICIAL LEG.—Douglas Bly, New York City.

First, I claim a set of springs, G G, in combination with the leg, A, and foot, B, forming a universal joint, substantially as specified.

Second, I also claim arranging the series of springs, G G, near the periphery of the socket, C, surrounding the center of motion, in such a manner that the central space will be left open, when said springs are employed between the foot and leg to produce reaction by compression, substantially as described.

Third, I also claim the arrangement of the plate, H, provided with the bearing, l, and the bolt, m, connecting with the spring, I, when used in communication with the toe joint, h, in such a manner as to work over it and produce the necessary leverage, substantially as set forth.

57,667.—GRINDING MILL.—Cornelius Bollinger, Harrisburg, Pa.

First, I claim mounting the fan, K, loosely upon the spindle, C, to adapt it to be rotated independently of the latter, substantially as and for the purposes set forth.

Second, I claim the driver, I, formed with an air passage or passages, i i, to enable the air from the fan to be discharged between the stones through the driver, substantially as described.

Third, I claim the combination with the hoop, L, of the circular plate, L', to form the ventilation passage, L2, as and for the purposes specified.

57,668.—CULTIVATOR.—J. W. Boosinger, Marine, Ill.

I claim, First, The clevis, D', and strap, D2, when constructed and employed substantially as described and set forth.

Second, The combination of the plow beams, D, with the clevis, D', also the combination of the said beams with the devices, E a a', a3, for the purposes and in the manner substantially as described.

67,669.—DRY HOUSE.—John K. Boswell, Richmond, Ind.

I claim, First, The rectangular heater, G, when the same is provided with the cylindrical valves, H H', as and for the purposes set forth.

Second, The combination of the rectangular heater, G, the valves, H H', the openings, K K', and the connecting pipe, b', all arranged and operating substantially as and for the purposes set forth and described.

Third, The arrangement of the movable lattice platform, F, and rectangular heater, G, and valves, H H', substantially as set forth.

57,670.—REFRIGERATOR BUILDING FOR PRESERVING FRUIT, ETC.—James A. Boyer, Greensburgh, Ind.

I claim, First, The combination and arrangement of the pipes, B B, situated one in the lower, the other in the upper part of the chamber, C, the bellows, D, or its equivalent, situated as described, and the series of V-shaped air passages under the ice chambers, so that the air will be drawn from the lower part of the chamber cooled by the condenser, and forced into the upper part of said chamber, substantially as described.

Second, In combination with the above parts, I claim the absorbing chamber, G, constructed and operating as described.

Third, The construction and arrangement of the cooling or condensing apparatus as shown, to wit, having a series of ducts or air passages, a a, inclined in V form, and placed underneath the ice chamber having a V-shaped bottom, the whole being constructed and operating substantially in the manner and for the purpose set forth.

Fourth, The arrangement of the absorbing chamber as shown, to wit, having said chamber provided with a partition plate, e, and pipe, H, constructed and operating substantially as described.

Fifth, In combination with the pipes, B B, or chambers, b* c*, connected therewith for ingress or egress of the air, I claim a thermometer and barometer for the purposes described.

57,671.—ORGAN REED.—A. M. Brush, Clayton, N. Y.

I claim an organ reed made of silver either alone or mixed or alloyed with one or more metals.

57,672.—PORTABLE FENCE.—George S. Carlisle, Columbus City, Iowa.

I claim the arrangement of the braces, F F, and end posts, A, relating to each other and operating in the manner and for the purpose herein described.

57,673.—ELECTRIC TELEGRAPH.—Alonzo Chace, Syracuse, N. Y.

First, I claim in combination with the devices above shown for breaking the electric connection upon a telegraph line, that is to say, the block, N, and its appurtenances, and the connecting pole, Y, and its appurtenances, made and applied substantially as above set forth.

Second, I also claim the block, N, and its spring, T, in combination with the wires that compose a line of telegraph, substantially as above set forth.

57,674.—WELL TUBE.—John Chandler, Cold Water, Mich.

I claim the perpendicular loop rods, a a, as described in combination with the wire gauze tube, d d, inside supporting spiral coil, e e, cone point, c, and tube, A, substantially as and for the purposes set forth, thereby adding great strength and security to the lower tube.

57,675.—DEVICE FOR FASTENING THE SLATS OF VENETIAN SHUTTERS.—George L. Chapin, Chicago, Ill.

I claim the arrangement and combination of the plate, F, bolt, J, screw, C a, and the notched band, K, substantially as set forth and described.

57,676.—CORN PLANTER.—Barnabas Clark, Mackinaw, Ill.

First, I claim the clutch, G, in combination with the axle, F, cells, c, wheel, B B', arranged and operating in the manner and for the purpose herein specified.

Second, The marker, P, when applied to or used in combination with the loose axle, F, substantially as and for the purpose specified.

Third, The attaching of the openers, J, and colters, L, to the bars, K K', applied to the frame, A, and connected with a foot bar, O, substantially as and for the purpose set forth.

Fourth, The ratchet, Q, on the loose axle, F, in connection with the pawl, R, attached to the lever, S, when said parts are used in combination with the maker, P, and the seed-distributing device, all arranged substantially as and for the purpose specified.

57,677.—ATTACHING KNIVES TO THEIR HANDLES.—William Clayton, Bristol, Ct.

I claim the recessed bolster, a, of the blade, A, in combination with the tang, D, and nut, d, arranged with the ferrule, c, guard, C, and handle, B, in the manner and for the purpose herein specified.

57,678.—MACHINE FOR CUTTING STALKS IN THE FIELD PREPARATORY TO PLOWING.—G. W. Cole, Canton, Ill.

First, I claim the combination of a cylinder of cutters, O, and its supporting frame, I, with the main frame, A, when said frame, I, is hinged at its rear end to the frame, A, and has a vertical adjustment at its front end, operating substantially as and for the purpose set forth.

Second, The hook, m, constructed as described in combination with the hanging posts, j, arranged substantially as and for the purposes set forth.

Third, The notched or toothed open standard, Q, lever, S, spring catch, e, rod, g, and staple, h, in combination with the frames, A and I, all substantially arranged as and for the purposes set forth.

Fourth, The levers, r, and rods, p, in combination with hooks, m, arranged substantially as and for the purposes set forth.

Fifth, The spring fulcrum, S, in combination with the frame, A, and lever, r, arranged substantially as and for the purposes set forth.

Sixth, The curved arms, y, and lever, w, as described, in combination with the levers, r, and catch, q, all arranged substantially as and for the purposes set forth

57,679.—WASHING MACHINE.—Thomas Cole, Marshalltown, Iowa.

I claim, First, The yielding lever, A A, as applied to the washing machine, substantially as herein described.

Second, I claim the fulcrum wedge, K, in connection with the yielding lever, A A, as applied to the washing machine, substantially as herein set forth.

57,680.—FILE-CUTTING MACHINE.—Henry B. Comer, Pittsburgh, Pa.

First, I claim moving the file blank and its bed through the medium of the cutting tool by means substantially as herein described and for the purpose set forth.

Second, The adjustable lifting arm, m, when used in combination with the lifter, 3, hammer, f, mandrel, d, and cutter, 9, as herein described and for the purpose set forth.

Third, The tool holder, B, provided with spring, o, set screw, 5, and piece, e, for holding the mandrel, d, said holder being used in combination with the lever, 10, spring, g, lifter, n, cam, I, eccentric lifter, 2, constructed, arranged, combined and operating substantially as herein described and for the purpose set forth.

57,681.—CLOTHES DRIER.—J. C. Connor, Dover, N. H.

I claim the bars, V W X, constructed as described in combination with each other with the horizontal bars, C I J and Y, and with the end pieces, A B F G, of the clothes drier, substantially as described and for the purpose set forth.

57,682.—APPARATUS FOR GENERATING GAS.—Mathias P. Coons, Brooklyn, N. Y.

I claim the internal arrangement of the retort, B, with the cylinder, D, and in the lamp, Fig. 4, the wick tube, J, and also the connecting tubes as arranged, marked L L.

I also claim the application of the safety valve, I, for the purpose and in the manner described and in combination therewith the application of the stop cock, in the manner and for the purpose described.

I also claim generating gas from volatile fluids by introducing the same into a generating retort by capillary attraction, for the purpose and in the manner herein set forth and described.

57,683.—BAG HOLDER.—Gilbert C. Corbin, St. John's, Mich.

I claim the arrangement of the board, a, and expanding holders, m n, operating substantially as described and represented.

57,684.—TWEER.—F. A. Deutenberg, Pittsburgh, Pa.

First, I claim the vertical center blast blacksmith fire tewel or tweer, having the chamber, H, with its dome, E, in which is the hole, J, and an annular channel K, at its top part, substantially as and for the purpose specified.

Second, The bend upward, B C, of the pipe, A, in combination with the receiver, H, dog, E, and door, G, as described and for the purpose specified.

57,685.—FRUIT GATHERER.—Alonzo R. Dinsmore, Auburn, N. H.

I claim the improved fruit gatherer made substantially as described, that is as consisting not only of the hole, the padded annular and disk jaws, and mechanism or means for opening and closing the disk jaw, but of the cloth or flexile conductor and the tubular cushion, arranged as specified.

57,686.—APPARATUS FOR CARBURETING AIR.—Silas R. Divine, New York City.

I claim the use of the chambers, B B B B, when placed one within another and composed of porous or perforated walls, substantially as described.

57,687.—GALVANIC BATTERY.—Joseph Dixon, Jersey City, N. J.

I claim, First, The combination in a galvanic battery of the porous diaphragm and negative metal or element in one and the same cell, substantially in the manner and for the purposes herein-before described.

Second, The graphite cell composed of pure plumbago and clay, or other material of which plumbago is the conducting ingredient, when combined in the proportions, substantially as herein-before stated.

57,688.—GANG PLOW.—James W. Donaldson, Daniel Sheets and Allen C. Miller, Suisun, California.

We claim the peculiar construction of the frame in order to obtain sufficient strength for a number of plows by placing the diagonal bars, A2 A3, between the parallel bars, A' A1, and the cross braces, a a1, substantially as described.

Second, The manner of attachment of the plows to their respective portions of the frame by means of the bent braces, C C C, passing over the top of said frame-work as herein shown in combination with the plows, substantially as described.

Third, The adjustable wheel, E, and scraper, f, with the wheels, G G, scrapers, N H, also the turn plates, H H, and connecting rods, h h1, with upright bars, J J, jointed at the turn plate, H, in combination with the sweep L, substantially as described and for the purpose set forth.

57,689.—BRICK MACHINE.—Richard A. Douglas, Chicago, Ill.

I claim, First, The combination of the series of grinding rollers, a and a', being so geared that one of each pair shall revolve faster than the other with the hopper, d, and the charger, G, when arranged to operate as shown and described.

Second, I claim the charger, G, provided with the chamber, g, and the lubricating reservoir, h, arranged to operate in connection with the hopper, d, substantially as set forth.

Third, I claim the plungers, 1 2 3, and arranged to operate in combination with the molds, J, and the followers, 1' 2' 3', etc., when said plungers and followers are operated by the cams, l m and n, as shown and described.

Fourth, I claim the arrangement of the cam wheels, N, and the accompanying mechanism for operating the charger, G, as set forth.

Fifth, I claim the means substantially as shown for adjusting the hight of the plate, L, and its followers.

Sixth, I claim the means of adjusting the movements of the charger, G, by means of the slotted arm, r, and pin v, substantially as shown and described.

57,690.—PROPELLER FOR STEAMSHIPS.—Arthur Doyle, New York City.

First, I claim the combination of the vertical buckets, a a, with the side beams, b b, the upright arms, c c, the radial arms, h j, and the crank, e, with the shafts, f, as applied either to the side or stern of a ship in connection with the system of balance beams and oscillating bars, constructed, arranged and operated substantially as and for the purposes herein described.

Second, I claim also the combination of the buckets, a', a', with the side beams, b' b', the main central upright arm, c', and the half arms, c2 c2, the radial arms, h' j', and j2, the slide, z, and the crank, e', with the shaft, f', as applied to the side of a ship in connection with the system of balance beams and oscillating bars, constructed, arranged and operated substantially as and for the purposes herein described.

57,691.—ARTIFICIAL LEGS.—John S. Drake, New York City.

First, I claim the malleable cast metal frame for artificial limbs formed in the manner and for the purpose specified.

Second, I claim the straps, l l, of the cast metal frame, A, applied in the manner and for the purposes set forth.

Third, I claim the spring metallic frames for the toes, each attached by a separate rivet or screw so as to be movable, as set forth.

Fourth, I claim the curved metal spring, n, introduced at the ankle joint, with its ends attached to the heel, D, and frame, C, and acting to keep the toes of the foot from dropping, as set forth.

57,692.—OPERATING ORDNANCE.—James B. Eads, St. Louis, Mo.

I claim the combination of a pair or more of gun carriages so connected as to preserve the parallelism of the axes of the guns with a corresponding number of curved tracks so arranged as to cause the said axes to vibrate upon a given point in the embrasure, substantially as described.

57,693.—DEVICE FOR TRANSMITTING MOTION.—Thomas C. Entwistle, New York City.

I claim the combination and arrangement of three bevel gears C D E, and a revolving yoke, F, or its equivalent, to operate substantially as herein specified.

57,694.—NECK-TIE SUPPORTER.—J. A. Eshleman, Philadelphia, Pa.

I claim the holder composed of the plate, a, and arms, b and b', the whole being constructed and arranged for the reception of a scarf, substantially as and for the purpose described.

57,695.—LUBRICATING BUSH.—S. H. Everett, Milton, Ohio.

I claim the lubricating bush D, having orifices, n, n, or their equivalents, when used in carriage boxes or in bearings for machinery in the manner substantially as described and for the purposes specified.

57,696.—STEAM CARRIAGE.—Mathew Fletcher, Louisville, Ky.

First, I claim the application of a rotary steam engine to each propelling wheel, for stability of carriage, avoiding dead centers, and enabling the driver to have at his command with ease, and by the power of steam to back, turn or advance.

Second, I claim the arrangement of the engine, piston and wheel operating together (or independently), with the piston and wheel on the opposite side of the carriage, for the purpose set forth.

Third, I claim suspending the whole weight of carriage and engine to the axle.

57,697.—TURNING ON AND SHUTTING OFF GAS BY ELECTRICITY.—Samuel Gardiner, Jr., New York City.

First, I claim the wheel D, provided with the non-conducting and conducting surfaces substantially as described, and rotated by a crank whose revolutions are registered by or upon a dial, substantially in the manner and for the purpose described.

Second, I claim the dial with its light and dark segments or portions to indicate in connection with a certain opening or place on the dial plate or other fixed object, the position of the stop-cock or other object for the movement of which the apparatus is designed substantially as described.

Third, I claim the revolving arm and spring tooth, M, m, operating in connection with the stud, c', or its equivalent, to rotate the wheel, D, by engagement with the cogs thereof, as described.

Fourth, I claim the combination of the shaft, D, wheel, D, spring tooth, m, arm, O, and spring detent, N, as and for the purpose described.

Fifth, I claim the arrangement of the key, G, and spring keys, g g' g'', with the portions, d d' d'', constituting the wheel, D.

Sixth, I claim the arrangement of the shaft, B, studs, r r, wheel, s, and detent, S, the pinion, T, spur wheel, U, and dial, V, operating substantially as and for the purpose described.

57,698.—FARM GATE.—Francis Gay, Bedford, Ohio.

First, I claim the shaft, D, arms, H and J, and gate, A, when the several parts are combined and operate as and for the purpose set forth.

Second, I claim the standard, D, face plate, E, and wheel, G, in combination with gate, A, as and for the purpose specified.

57,699.—CULTIVATOR.—William Geahr, New Holland, Pa.

I claim the independent, adjustable and reversible beams, D D, in combination with the upright, E, F, when connected with a suitable frame work, substantially in the manner and for the purpose specified.

57,700.—CULTIVATOR.—George T. Gifford, Monmouth, Ill.

First, The arrangement of the frames, B and A, and movable pivot, L L, for balancing, substantially as described.

Second, The combination of the lever, F, cross bars, E and C, and plows, G G, with the inside frame, for the purposes set forth and substantially as described.

Third, The arrangement of frames, B B and A A, by which the weight of driver supports or tends to lift plows, substantially as described.

Fourth, The slide, s, operating in the axles, as described and for the purpose set forth.

57,701.—SMELTING FURNACE.—John L. Gill, Jr., Columbus, Ohio.

I claim constructing a cupola or smelting furnace in such a manner as to allow of a part of the upper portion (of such cupola or smelting furnace), being made from a hollow steam boiler for generating steam to be used in the production of a blast, or for any other purpose as described above.

57,702.—CAP.—Simon Goldstone, Philadelphia, Pa.

I claim a cap having a series of eyelet holes through the back, opening from the exterior into the space contained between the body and the band, and series of eyelet holes through the band, opening from the interior of the cap into the same space and having an oil silk perspiration shield, the whole arranged and operating with respect to each other, substantially as is herein specified and described.

57,703.—MOP AND SCRUBBER.—William T. Grant, Jacksonville, Ill.

I claim the combination of the brush head, A, the rubber head strip, B, mop, F, handle, C, bar, E E, cylinder, D, catch or pin, o, and arm, g, as and for the purposes set forth.

57,704.—LOCK.—James T. Guthrie, Leesburg, Ohio. Antedated August 17, 1866.

I claim, First, The two bolts, B and B', having spring checks, C and C', pin, d, and springs, b and b', arranged and operating as above described and set forth.

Second, Guard bolt, D, sliding incline, D', lever, F, spring, G, and catch spring, i, constructed as above described and for the purpose set forth.

57,705.—SHEARS FOR CUTTING BOLTS.—Jones Guthrie, Wilmington, Del.

I claim the combination of the parallel levers, A A, the joint, B, with the connecting plate, E, and movable knife, G, operating against an opposite knife, J, and the set screw, L, all constructed and arranged as herein described, for the purposes set forth.

57,706.—HAY RAKE.—E. R. Hall, Ilion, N. Y.

I claim, First, The suspending or fitting of the rake, G, between swinging bars, F F, connected to the front end of the frame, A, and having an arm, H, connected with the rake head, substantially as and for the purpose set forth.

Second, The lever, I, fitted within the arm, H, in connection with the pins, f f, on the rake head, c, when said parts are applied to a suspended rake, G, substantially as and for the purpose specified.

Third, The lever, L, on the axis, J, provided with the arm, g, connected with the arm, H, by a chain, K, in combination with the pawl, M, attached to lever, L, and the rack, N, secured to a board on the front part of the seat supports, a a, substantially as and for the purpose specified.

57,707.—COMBINED SOWER AND DRILL.—George W. Hall, Augusta, Mich.

I claim, First, The pendent frames, M, carrying furrowing wheels, S, drills, N, for the purpose substantially as described.

Second, I claim a machine for sowing different kinds of grain, when provided with pendent frames, carrying the furrowing wheels and drill tubes, substantially as and for the purposes herein set forth.

Third, The combination and arrangement of the levers, J K Y and Y, connected to the slides in the seed box, L, and agitator, X, in the box, O, with the elbow lever, D, and cam, c, all for the purposes and substantially as herein set forth.

Fourth, I also claim the plows when constructed and operated as herein shown.

57,708.—MANUFACTURE OF ARTIFICIAL FUEL.—William Halsted, Trenton, N. J. Antedated August 10, 1866.

The combination, mixture and treatment of the ingredients above mentioned, substantially as above described and intended to produce the same effect.

57,709.—FOLDING CHAIR.—E. Hambujer, Detroit, Mich.

First, I claim the head part, D, having legs, E, in combination with the parts, C B, hinged to each other and with frame, A, provided with pivoted legs, F, and braces, f, arranged and operating substantially as represented and described.

Second, The screw socket, C, in combination with the legs, F, and frame of the part, B, substantially as described and for the purpose set forth.

57,710.—GRAIN BINDER.—Henry Harrier, Indianapolis, Ind.

I claim the cylinder, V, with its square shaft, W, the grain gatherer, T, and the concave, U. I also claim the combination of the spring, a, with the arrangement, L, and the lever, R.

57,711.—ILLUMINATED SIGN.—James Harrison, New York City.

I claim the combination of the close glass cups, C, with the block or raised work, B, of the letters or devices to be shown, and with the back ground, A, substantially as herein described and for the purpose set forth.

57,712.—POWER LOOM.—Philo W. Harf, Stamford, N. Y.

First, I claim the sliding plate, f, applied to work through the lay of the loom, and in combination with the movable trap at the bottom of the shuttle box, substantially as and for the purpose herein described.

Second, The fingers, w w, attached to the lay of a loom and operating in combination with the movable trap at the bottom of the shuttle box, substantially as and for the purpose herein set forth.

Third, The spare shuttle box, I, attached to a breast beam or framing of the loom, having a movable trap at its bottom and operating in combination with a shuttle box having a movable trap at its bottom on one side of the lay, substantially as and for the purpose herein described.

Fourth, The combination of the spare shuttle box working on fixed brackets, J J, or their equivalent attached to the breast beam or other fixed portion of the loom, the rock shaft, K, carrying the fingers, w w, and furnished with a pin, z, and the stationary arm, L, the whole operating substantially as herein set forth.

Fifth, The sliding plates, N M, in combination with each other with the lay and one of the shuttle boxes thereon, and with the spare shuttle box, substantially as and for the purpose herein described.

57,713.—GATE.—B. S. Healy, Cohocton, N. Y.

First, I claim the curved metallic strip, K, in combination with the notched top rail of the fence with the gate post, B, and with the perpendicular support, L, substantially as described and for the purpose set forth.

Second, The combination of the supporting piece, O, with the gate post, B, the perpendicular support, L, and with the shortened bottom rail, G, of the gate, substantially as described and for the purpose set forth.

57,714.—RAKING AND BINDING ATTACHMENTS TO REAPERS.—Marshal D. Higley and Dana L. Columbia, Morristown, Ill.

We claim in an automatic rake for a harvester the combination of the eccentrics, D and E, connecting rods, G and D2, bell crank, G1, and oscillating rake arm, H, said parts being respectively constructed substantially as described.

Second, The oscillating rake arm, H, and parallel rod, H1, adjustably attached to the levers, H2, when used in combination with the eccentric, D, and connecting rod, D2, substantially as set forth.

Third, We claim the wheel, I, with the track, I2, and depressions, I3 and I4, when used for actuating the levers, N1 and M3, respectively, substantially as and for the purpose set forth.

Fourth, The twist head, L, when constructed in two parts, L1 and L2, the part, L2, being arranged to turn on a pivot, the opposed faces of the parts being perpendicular to the axis of rotation, and the said parts being constructed and arranged substantially as set forth.

Fifth, In combination with the twist head, L, we claim the clutches, N N, attached to levers, N1 N1, which have their fulcrums near the center, and are opened and closed by a spring, O, and cam, I, substantially as set forth.

Sixth, In combination with the twist head, L, we claim the nippers, M M1, one being fixed and the other movable, when they are respectively constructed and the movable one actuated substantially as set forth.

Seventh, In combination with a device for binding the sheaf, we claim the revolving arm, R1, for throwing the sheaf from the platform, substantially as set forth.

Eighth, We claim the cam, C, having a dead point, a b, when used in combination with, and for the purpose of giving motion to, the binding arm, G, substantially as set forth.

Ninth, The shield, U and U2, when used in combination with an automatic binding mechanism, substantially as and for the purpose set forth.

57,715.—GUARD FOR RAILWAY CROSSINGS.—Asa Hill, North Providence, R. I.

I claim an improved safe-guard or barrier for railroad crossings, composed of a bar applied to uprights at each side of the roadway in such a manner that the bar may be raised or lowered by means of cranks or pivoted arms in the manner substantially as herein shown and described.

57,716.—TURNING LATHE FOR TURNING SCYTHE SNATHS.—Spencer Hinton, assignor to Withington, Cooley & Co., Jackson, Mich.

First, I claim the two plates, G H, with hollow bugle-mouthed journals, J J, respectively on each, and a pulley, P, on one, G, fastened together in such a position with the pieces, L L, between them, and diametrically opposite to each other, so that the journals, J J', will be in a line with each other, and retain certain gage and knife holders between them, substantially as and for the purpose specified.

Second, The two gage and knife holders, B B, moving toward and from the center of rotation between the plates, G H, substantially in the manner as and for the purpose set forth.

Third, I claim so fitting the ends of gages where the parts of the circle pass each other (when the gages are closed up, as in Fig. 1) into each other, that as they open they will tend nearer to form a complete circle, and when fully open the circle will be complete, as shown in Figs. 3 and 4.

Fourth, I claim attaching the knife and feed knife to gage and knife holders, as herein described.

57,717.—LOOM.—Isaac N. Hodson, Mount Pleasant, Iowa.

First, I claim the cranks, a a', two or more, and cam rollers, F, in combination with the batten, G, and heddle frames, E, constructed and operating substantially as and for the purpose set forth.

Second, The hinged swords, h h' and dogs, k k', in combination with the batten, G, and shuttle blocks, j j', constructed and operating substantially as and for the purpose described.

57,718.—WOOD-BORING MACHINE.—David Hoit, Fort Wayne, Ind.

First, I claim the auger shaft, G, shafts, C and D, and guide posts, B and B', arranged and operating as described.

Second, The shaft, L, screws, J J', nuts, m m', and yoke, M, as and for the purposes set forth.

Third, The arrangement and combination of the parts herein described for giving the auger of a boring machine a perpendicular and horizontal motion independently or simultaneously, in the manner and for the purposes herein set forth.

57,719.—CULTIVATOR.—Jacob Hollinger, Millersburgh, Ohio.

I claim the herein described construction of cultivators, consisting of the beam, A, curved bars, B B, braces, D, shears, C B' B', and handle, E, several parts being constructed, arranged, and operating as and for the purpose set forth.

57,720.—BED BOTTOM.—E. F. Holloway and J. W. Hudelson, Knightstown, Ind.

We claim, in combination with the rails, A, the strips, C, springs, B, and removable slats, D, the said several parts being respectively constructed and the whole arranged for use substantially as set forth.

57,721.—APPARATUS FOR PRESERVING MILK.—Noah P. Holmes, Indianapolis, Ind.

I claim the can, 1, with its double lining, 77, for charcoal, its cylinder with ice, 5, separate lids, 24, and ventilators, 35, for the purpose described, and all arranged substantially as set forth.

57,722.—TRUSS.—T. L. Hough, Philadelphia, Pa.

I claim the combination of the hub, D, spring, m, arm, B, and journal, a, arranged to operate as and for the purpose herein set forth.

57,723.—STAND AND MIRROR.—W. H. Hughes and H. L. Lent, Peekskill, N. Y.

We claim a combined toilet stand, or its equivalent, and mirror, when the latter, by its staff or rod, H, is hung or suspended to the said stand by means of a cord, J, pulley or pulleys, K, and weight M, substantially as described and for the purposes specified.

57,724.—PLOW.—Herbert A. Hummer, Franklin Township, N. J.

I claim uniting the mold board and land side of the plow by a concealed joint, constructed and arranged substantially as and for the purpose described.

57,725.—PLATE FOR ARTIFICIAL TEETH.—George H. Hurd, St. Louis, Mo.

I claim the plate, B, when constructed with the flanges, b, either with or without the suction cavities, b1, so that artificial teeth may be fitted into mouths of bad formation, and secured there, either by suction, or by muscular power, or by both.

57,726.—DENTAL MOLD.—George H. Hurd, St. Louis, Mo.

I claim constructing dental molds, or impression frames, A, so that their edges, b and b', will be wide enough apart to take an impression of the lip muscles and tongue shelf at the same time, substantially as herein described and set forth.

57,727.—BURNING FLUID.—John Jann, New Windsor, Md.

I claim the combination of benzine, sweet oil, and oil of vitriol, in about the proportions and for the purpose described.

57,728.—MANUFACTURE OF POT AND PEARL ASH.—Benjamin F. Jewett, Malone, N. Y.

I claim the process of manufacturing pot ashes and house ashes into pearl ashes, by the use of black muck, substantially as herein specified.

57,729.—APPARATUS FOR CARBURETING GAS.—Algenon K. Johnston, New York City.

I claim the use of the materials above described, for the purposes set forth.

57,730.—CHURN.—J. D. Kellogg, Jr., Northampton, Mass.

I claim the dasher provided, the opening, b, and the inclined surfaces, a c, sloping in different directions, and operating as described.

57,731.—FRUIT GATHERER.—Zebalon S. Kelsey, Huntingdon, Ohio.

I claim the construction and arrangement of the fruit gatherer, as herein set forth.

57,732.—CAR COUPLING.—John Kingsbury, Ravenna, Ohio.

First, I claim the arrangement of the jaws, C, when pivoted together, and to the adjustable stay, B, in combination with the standard, E, springs, J D, chain, F, and windlass, as specified.

Second, The hook, D', and adjustable stays, K, when arranged and pivoted, as set forth, in combination with the spring, N d, and jaws, C, as and for the purpose set forth.

57,733.—SASH LOCK.—D. P. Lacey and J. A. Bartlett, Oxfordville, Wis.

We claim the combination and arrangement of the tumbler, a b f h, lock bolt, d j k, and spring, m and e, substantially as and for the purpose set forth.

57,734.—CORN PLANTER.—Alexander Ladd, St. Lawrence, N. Y.

I claim the slide, B, provided with a hole, e, in combination with the box, A, and the hole, f, in the bottom, c, thereof, when said parts are arranged as shown and described, to admit of the dispensing with the ordinary strike or cut-off, for depriving the hole, e, of superfluous corn or seed, as set forth.

Second, I further claim, in combination with the box, A, and slide, B, arranged as shown, the false bottom, E, having its lower end beveled or chamfered at its under side, substantially as and for the purpose specified.

57,735.—FENCE.—Charles Lee, Winchester (Sandy P. O.), Ohio.

First, I claim the posts, A, when constructed substantially as herein described and for the purposes set forth.

Second, The combination of the loops, C, when constructed as herein described, with the posts, A, and boards, B, substantially as and for the purpose set forth.

Third, The combination of the key or wedge, E, with the posts, A, loop, C, and boards, B, substantially as described and for the purpose set forth.

57,736.—MACHINE FOR TENONING SPOKES.—James Lefeber, Cambridge City, Ind.

First, I claim supporting the gear frames, P or J, upon the movable frame, S, and providing for their vertical adjustment thereon, substantially as described.

Second, I also claim, in combination, the movable frame, S, the gear frame, P, and the carriage, D, substantially as described.

57,737.—LUBRICATING OIL.—Joseph M. Lippencott, Pittsburgh, Pa.

First, I claim the reduction of the gravity of hydrocarbons, or petroleum oil, by the admixture of pine tar, substantially as above set forth.

Second, I claim the use of pine tar in the manufacture of lubricating oils of any desired gravity, in combination with hydrocarbons or petroleum.

Third, I also claim the use of pine tar, in the manufacture of lubricating oils, in combination with hydrocarbons or petroleum, animal oils, tallow, or fatty matter of any description.

57,738.—BARREL FOR PETROLEUM, ETC.—John S. Lipps, Brooklyn, N. Y.

I claim a barrel, for hydrocarbon liquids, provided with an air pipe, c, and escape orifice, a, substantially as and for the purpose described.

57,739.—GRAIN BINDER.—Sylvanus D. Locke, Janesville, Wis.

First, I claim the combination and arrangement of the part, C, pitman, O, constructed substantially as described, crank, t, shaft, A, standard, J, and head, Y, when the whole are constructed, arranged, and used, substantially as and for the purpose set forth.

Second, The combination and arrangement of the part, C, pitman, O, constructed substantially as described, shaft, A, standard, J, and head, Y, and shaft spring, F, when the whole are constructed, arranged, and used, substantially as and for the purpose set forth.

Third, The combination and arrangement of the part, C, pitman, O, projection, m, cylinder, B, pin, D'', shaft, A, crank, p, standard, J, and head, Y, when the whole are constructed, arranged, and used, substantially as and for the purposes set forth.

57,740.—WASHING MACHINE.—M. J. Lourrentz, Leavenworth, Kansas.

First, I claim the reciprocating rubber, I, operated from a rock shaft, J, as shown, in combination with the pressure rollers, C, arranged with springs, E, connected with adjustable bars or slides, F, substantially as and for the purpose herein set forth.

Second, The pounder, M, connected with the rock shaft, J, through the medium of the tubular rod, N, sliding rod, O, and spring, P, substantially as and for the purpose specified.

Third, The operating of the rock shaft, J, through the medium of the toothed segments, m n, counterpoised lever, K, and hand lever, L, all arranged substantially as described.

57,741.—FRUIT PICKER.—C. M. Lunt and W. F. Lunt, Biddeford, Me.

We claim an instrument for picking fruit, constructed and operating substantially as shown and described, that is to say, we claim the combination of the handle, A, rod, B, tines, d, spring, b, cords, e, apron, C, and basket-supporting hooks, f, substantially as shown and described.

57,742.—SLOP HOPPER.—John Marguis, San Francisco, Cal.

First, I claim the construction and arrangement of the stationary hopper, E E, and movable hopper, D D, substantially as described, and for the purpose set forth.

Second, I claim the bowl or pan, G A', or its equivalent, placed upon standards in the bottom of the lower legs, in the outer hopper, or attached to the inner hopper, D, and which forms, together with the lower portion of the movable hopper, and the upper portion of the connection pipe, I, the trap, A'' A'', substantially as described, and for the purpose set forth.

Third, I claim arranging the inner hopper in the stationary or outer hopper, so as to form the upper trap, A, as herein specified and for the purpose set forth.

57,743.—METAL FRAME FOR PIANOS.—Martin Martins, New York City.

First, I claim the tension screw rods, h, and springs, j, in combination with the frame, A, constructed and operating substantially as and for the purpose described.

Second, The L-shaped plank, i, in combination with the lips, e f, of the frame, A, and with the tension screw rods, h, constructed and operating substantially as and for the purpose described.

57,744.—RAILROAD SWITCH.—H. Maxel, E. Fessler, and H. Fessler, Canton, Ohio.

First, We claim the switch box, A, with inner box, N, and windows, C D, with signal, T, arranged in the manner substantially as and for the purposes set forth.

Second, The semi-circular wheel, E, wheel, R, wheel, H, crank, K, lever, J, and spring, b, arranged within the switch box, A, as and for the purposes herein specified.

Third, The shaft, M, attached to the wheel, E, by means of the arm, P, and metallic plate, c, working the rod, F, when arranged and used as and for the purposes set forth.

57,745.—Carriage Gearing.—J. R. McAllister, Richville, N. Y.

First, I claim the brace rods, G G2, secured to the wagon body at one end and at their others respectively to the hind axletree and the head block, E, of the front spring of the said body, substantially as and for the purpose described.

Second, The swinging frame circle, O, o the front head block, E, in combination with the plate or circle, P, fixed to the front axletree, the two being connected together, substantially as described and for the purpose specified.

57,746.—Refrigerator for Liquids.—Robert W. McClelland, Springfield, Ill.

I claim a refrigerator for cooling ale, beer, and other liquids, arranged so that the casks may be supported upon slides, E, resting upon the ways, D, in the upper part of the chest, A, and the liquids be conducted by a flexible pipe, G, into a receiver, I, inclosed in the cooling tub, H, and then drawn for use through a faucet, m, passing through the small doors, O, said several parts being consiructed and arranged substantially as set forth.

57,747.—Guard Attachment for Cultivators.—Thomas B. McConaughey, Newark, N. J. Antadated Aug. 28, 1866.

I claim the application of a guard or guards to a cultivator, substantially in the manner as and for the purpose herein set forth.

I also claim the pivoting the bar, F, to which the plate or guard, G, is attached between plates, E E, secured to the cultivator near its front end and provided with a rest, b, substantially as described.

57,748.—Plow.—John McKinley, Bethesda, Ohio.

First, I claim the point, e, constructed substantially as described.

Second, The combination of the point, e, with the share, c, colter, b, and mold board, a, substantially as herein set forth.

57,749.—Burning Fluid.—G. H. Mellen and J. C. Hazleton, Washington, D. C.

We claim an illuminating oil composed of the several ingredients named and of the proportions, substantially as set forth.

57,750.—Churn.—Jacob H. Mendenhall, Cerro Gordo, Ind.

First, I claim the combination of the dasher, H, shaft, G, adjustable gear wheels, E and F, crank shaft, B, and crank or cranks, D, with each other and with the box, A, and cover, C, when said parts are constructed and arranged substantially as herein described and for the purposes set forth.

And second, The combination of the gathering board, J, and spring catch, K, with the dasher shaft, G, substantially as herein described and for the purposes set forth.

57,751.—Revolving Ordnance.—Nathan L. Milburn, St. Louis, Mo.

I claim, First, The arrangement of the radiating series of barrels to revolve upon a central pin, b, furnished with trunnions, c c, and applied to operate substantial y as herein specified.

I claim, Second, The combination of the curved bar, L, the screws, M M, the rock shaft, K, and the clamps, p q, the whole applied in combination with the barrels and carriage, to operate substantially as herein set forth.

57,752.—Corn Cultivator.—L. B. Moore, Janesville, Wis.

I claim the construction of a corn cultivator, by the combination and arrangement of the various parts, substantially as they are described in the foregoing specification, or their mechanical equivalents, when used to produce the said automatic reciprocating motion of the said levers, J J, and shovels, X X, as specified.

57,753.—Machine for Shaving Hoops for Casks.—J. G. Morgan, Colton, N. Y.

I claim, First, The combination of the stationary bar, C, the pivoted bar, E, the knives, H, levers, J and L, and gage, K, substantially as herein described and for the purpose set forth.

Second, The combination of the inclined slotted table, M, the nippers, o, the sliding block, P, strap, S, clutch, t V, lever, W, and drum, T, on shaft, U, with the stationary and pivoted bars, C and E, substantially as herein described and for the purpose set forth.

57,754.—Grinding Mill.—Ellis Nordyke and Addison H. Nordyke, Richmond, Ind.

We claim the herein-described metallic eye for millstones, when constructed and operating as described.

57,755.—Tool for Working Wooden Legs.—Edwin Osborne, Philadelphia, Pa. Antedated Aug. 23, 1866.

I claim the plug, D, in combination with the burr cutters, constructed, arranged, and operating substantially in the manner and for the purpose specified.

57,756.—Boring Tool for Making Wooden Legs.—Edwin Osborn, Philadelphia, Pa. Antedated Aug. 23, 1866.

I claim the combination of the O G, or curved blades, H, with the burr or other cylindrical cutter for forming the orifice in the ankle portion of the artificial legs.

Also, the combination of the head piece, I, with the curved blades, H, and burr, E, for insuring perfect uniformity in depth and gage of cavity, substantially as described,

57,757.—Earth Scraper.—Nelson Peck, Jay, N. Y.

I claim, First, An improved scraper formed by combining the lever, G, bars, F, bars, L, levers, J, and bars, K, with each other and with the frame, L, tongue, B b', scraper, A, and draft bar, D, substantially as described and for the purpose set forth.

Second, The combination of the wheels, , and axle, O, with the frame, L, of the scraper, A, when the axle, O, is made and attached substantially as herein described and for the purpose set forth.

57,758.—Buckle.—John Peckham, New Haven, Conn.

I claim the combination of the frame, A, and tongue, B, formed and hinged together, in the manner herein set forth.

57,759.—Handle for Coal Shovel.—John Pfeifer, Philadelphia, Pa.

I claim the construction of the handle with the metallic neck, B, shoulder, d, and vanes, f f, in combination with the wooden handle, D, substantially as and for the purpose herein specified.

57,760.—Pump Piston.—Burrill and Edwin Pickering, West Milton, Ohio, and Barton Pickering, Montgomery county, Ohio.

We claim, First, The vertical part of the packing piece, A, having an inclined surface as represented for the purpose of holding the flaring packing, F, when combined with the rod, C, and valve seat, B, substantially as described and represented.

Second, The arrangement of the pieces, A B, packing, F, valve, E, and pump rod, C, substantially as described.

57,761.—Lighting Gas by Electricity.—Robert G. Pike, New York City.

First, I claim a plate for deflecting and spreading the gas as it comes from the burner before striking it with a spark so as the more readily to mingle the air with it before striking, and also for the purpose of directing the gas to the place of striking, substantially as described.

Second, I claim the combination of the metallic gauze, a, or perforated plate with the tube or cap or curved plate, and also with the deflector or spreader, substantially in the manner and for the purpose described.

Third, I claim the me allic button, or its equivalent, upon the deflecting pl te, operating substantially as described.

Fourth, I claim the combination of the gauze, a, deflector, D, and boss, n, substantially as described.

57,762.—Neck Tie.—James K. P. Pine, Troy, N. Y.

I claim the imitation neck tie, herein described, adapted for use with a turn-down collar, and consisting of paper of any desired quality or thickness, the surface being ornamented by printing, embossing, painting, staining, or otherwise.

57,763.—Floor Covering.—Anson H. Platt, Ann Arbor, Mich.

I claim, First, The application of paper printed in water colors, to heavy base paper, previously made water-proof by the use of my "water-proof compound," as a substitute for oil cloths and carpets, as herein described, under the head of "hand-made variety of paper floor covering."

Second, I claim the application of ornamental figures printed in water colors directly upon heavy strong paper previously made water-proof by the use of my "water-proof compound" (or by any other similar compound), combined with other articles to form a paint, as herein described, under the head of "factory-made variety of paper floor covering."

And third, I claim the "water-proof compound," and "enamel coating," as herein described, for the uses and purposes herein specified.

57,764.—Apparatus for Spreading Cement.—Joseph H. Putte, Cincinnati, Ohio.

I claim, First, A cement-spreading machine whose hopper, B, is provided with an adjustable gate, C, arranged and operating substantially as herein described and set forth.

Second, In combination with the adjustable gate, C, I also claim the trowel, D, as and for the purpose explained.

Third, In combination with the elements of the two preceding clauses, I further claim the set screw, E, or its mechanical equivalent, operating as herein explained and described.

Fourth, In combination with the drum, G, I also claim the pressure roller, I, for the purpose set forth.

57,765.—Fender for Carriage Wheels.—Stephen R. Rumsdell, Providence, R. I.

I claim, First, A rotating fender provided with a projection at one end and a recess at the other, for the reception of an adjustable center pin, in order that said roller may be placed in or removed from its bearings, or adjusted therein with facility, in the manner described.

Second, A bracket having arms provided with bearings for said rotating fender and set at such an angle with the side of the carriage on which it is placed that the wheel when in contact with said fender shall present to it as large a portion of the surface of its rim as possible, or in other words, shall be nearly or quite at right angles therewith, substantially as set forth.

57,766.—Fruit Gatherer.—F. J. Rauschert, Buffalo, N. Y.

I claim the combination of the strap, A, pole, D, trough, F, having spout, H, and canopy, R, when all constructed and arranged together, substantially as and for the purpose described.

57,767.—Car Coupling.—John H. Reed, New Haven, Conn.

I claim the combination of the toggle or coupling pin, c, rock shaft and crank, h and m, and the spring, e, with its appendages, d, when the whole is constructed, arranged, and combined, substantially as herein described and set forth.

57,768.—Lamp Extinguisher.—Wm. A. Richardson and Henry D. Ward, Worcester, Mass.

We claim the combinatfon of loop, B, cap or cover, C, and operating rod, D, with the tube, A, and top of the lamp, substantially as and for the purposes set forth.

57,769.—Tool.—Charles Richmond, Worcester Mass.

I claim the improved compound tool, consisting of the wrench socket and double bit, all constructed and arranged substantially as herein described.

57,770.—Bed Bottom.—E. R. Rison, Kinmundy, Ill.

I claim the combination of the wires or cords, C, the upright supporting pieces, B, the gun elastic springs, F, the plates, E, and screws, D, with each other and the frame, A, of the bed bottom, substantially as herein shown and described and for the purpose set forth.

57,771.—Shaft Coupling.—Benjamin Roach, Melrose, Mass.

I claim the arrangement and combination of the disk, D, and its ribs, b b, with the two coupling heads, C C, provided with grooves, a a, arranged in them to receive the ribs, as set forth.

57,772.—Hog Trough.—William H. Robbins, Richmond, Ind.

First, I claim the construction of trough, A, with the key or wedge bar, C, and lever, B, all arranged and operating as described.

Second, The equal distribution of the feed to each hog through the length of the trough at the same time, and in equal portions.

Third, This device of alternating the opening in the side of the trough, that more hogs can be accommodated in the same space than if they were all allowed on one side of the trough at the same time.

Fourth, I claim the manner of constructing the trough so that the hogs cannot get into the feed, and each one be entirely alone in his mess, all operating in the manner and for the purpose substantially as set forth.

57,773.—Ground Roller.—C. D. Roberts, Jacksonville, Ill.

First, I claim supporting the outer ends of the axles of rolls, C , in the hinged or vibrating boxes, a a, and the inner ends of the same in free ends of bars, b b, permitting the rolls thereby to adjust themselves to the inequalities of the ground, substantially as described.

Second, I claim the connecting link or bar, c', in combination with rolls, C C, hinged boxes, a a, and bar, b, when the rolls are arranged one in the rear of the other, as and for the purpose specified.

57,774.—Material for Kindling Fire.—C. A. Rose, Columbus, Ga.

I claim, as an improved article of manufacture, a fire kindler, made of compressed pine leaves, as herein described.

57,775.—Watchmaker's Lathe.—Frederick Shaller, Hudson, N. Y.

I claim the standard, B, provided with the slot, F, and formed in one piece with the base, C, and arms, D, in combination with the pins, E, bar, G, and rest, I, the whole being constructed and arranged substantially as herein set forth for the purpose specified.

57,776.—Card Rack.—E. Safford, Boston, Mass.

I claim, First, The peculiar method of shaping and holding in position the slats, S S' S" S"', etc., substantially as described and for the purpose set forth.

I claim, Second, The combination of the slats made and secured as described, with the board, B, and frame, A, substantially as described, and for the purpose set forth.

57,777.—Training Grape Vine.—George S. Salsbury, Clarendon, N. Y.

I claim the peculiar manner of training and trimming of the grape vine, so as to make it self sustaining, forming its own trellis, substantially as set forth, claiming the described method in its broadest sense.

57,778.—Stove-pipe Drum.—Hans Henrik Sennicksen, Richmond, Ind.

I claim the combination of the pipes, B and B' D and D' d and d', and the damper, C, when arranged and operated as set forth and described.

57,779.—Railway Crossing.—John L. Shaw, Fort Wayne, Ind.

I claim the railway crossing consisting of the bed plates, A, lapped and united as described, and used in combination with the rails, B, substantially as described.

57,780.—Machine for Piercing Leather.—G. V. Sheffield and J. F. Coburn, Hopkinton, Mass.

We claim the combined arrangement of the feed wheel, R, piercing tool, X, hammer, Y, feed rollers, F2, sliding chisel, R2, or its equivalent, substantially as herein described, and as and for the purpose specified.

57,781.—Die for Bolt-heading Machine.—John W. Sibbet, Cincinnati, Ohio.

First, I claim improved dies, formed in sections, and upon the several faces thereof, constructed, arranged, and combined with each other substantially as herein described, and for the purposes set forth.

Second, The combination with the above of the headers, K, constructed substantially as described, and for the purpose set forth.

57,782.—Gate.—George W. Sigerfoos, Joseph J. Sands, and George Fry, Potsdam, Ohio.

We claim the combination of the posts, B C D F, rollers, m, stay piece, n, and gate, A, substantially as described and for the purposes set forth.

57,783.—Machine for Making Metal Tubes.—Charles G. Smith, Chelsea, Mass.

I claim, in combination with a stationary triblet or mandrel mechanism for feeding the plate, mechanism for bending part of the plate into a tubular form over the surface of the triblet or mandrel, and mechanism for forming the opposite edges of the plate into a lap joint, the whole operating together to form the plate into a tube, substantially as described.

57,784.—Machine for Sinking Hollow Piles.—William S. Smith, Noyesville, Ill.

I claim the method of excavating solid materials from the interior of hollow piles by means of a current of air, using for this purpose the flexible discharge pipe, as herein described.

57,785.—Fruit Gatherer.—Young W. Smith, Bristol, N. Y.

I claim the combination of the endless adjusting cords, f f, and loops, k k, with the canvas, A, and bracing stakes, B B, operating substantially in the manner and for the purpose herein specified.

57,786.—Tumbler Washer.—John Solter, Baltimore, Md.

I claim the employment of a lever, K, or its equivalent, operating the valve stem, e', and valve, e, when in combination with the rim, n, for holding the tumbler, arranged substantially as and for the purposes set forth.

57,787.—Generating Gas for Motive Power.—Daniel E. Somes, Washington, D. C.

First, I claim combining nitro-glycerin with alkali, and converting the same into gas to be used as a motive power.

Second, Combining any kind of oil or fatty matter with alkali, and converting the same into gas to be used as a motive power.

Third, Compressing gas, air, water, steam, or any other liquid or volatile substance, substantially as and for the purpose herein described.

Fourth, The apparatus herein described, or its equivalent devices, for compressing gas, air, water, steam, or any liquid or volatile substance, and using the same as a motive power.

57,788.—Apparatus for Carbureting Air.—James F. Spence, Williamsburgh, N. Y.

First, The case, A, provided with two or more air or steam wheels, B B, working in the liquid in conjunction with each other, substantially as and for the purpose set forth.

Second, Heating the oil before it enters the machine by the jacket, E, surrounding the supply tank, D, in combination with a hot air or steam pipe, b, or any other suitable means, substantially as and for the purpose described.

Third, The hot-air chamber, F, in combination with the burner, a, case, A, and jacket, E, constructed and operating substantially as and for the purpose set forth.

Fourth, The float, d, provided with a valve, f, in combination with the liquid supply pipe, g, and case, A, constructed and operating substantially as and for the purpose described.

57,789.—Horse Hay Fork.—William S. Spratt, West Manchester, Pa. Antedated August 17, 1866.

I claim the combination and arrangement of the rod, b, provided with guide, i, and prongs, g and h, link or rod, c, lever, d, pulley, o, when used in connection with the frame, a a, constructed, arranged, and operating in the manner herein described and for the purpose set forth.

57,790.—Manufacture of Scythe Stones.—Alvin G. Squire, Pelham, Mass.

The cast-steel band and the mode of attaching it to the stone or wood, prepared as above stated, and to be used in connection with such stone or wood for the purpose of sharpening scythes, edge tools, and other implements requiring a sharp edge,

57,791.—Construction of Jointed Molds.—M. B. Stafford, New York City.

I claim a jointed mold composed of two parts, b b, connected together and constructed substantially as herein shown and described, so that when said parts are closed, a smooth interior is obtained, and the article or substance compressed and molded without leaving any crease, impression, or ridge, as set forth.

67,792.—Cultivator.—Addison F. Stillwell, Fayette, Iowa.

I claim the bar, E, beam, A, and cross bars, G, in combination with the bars, I, projections, b, spurs, f, shares, J, and brace rods, K, all arranged to operate as and for the purposes set forth.

57,793.—Attaching Artificial Teeth to Bases.—S. W. Stockton, Philadelphia, Pa.

I claim securing artificial teeth and gums to plastic bases by means of the tenons, d, arranged along on the rear part of that portion of the porcelain blocks which project inward just above the teeth, substantially as shown in the drawings and herein described.

57,794.—Churn.—Henry C. Stoll, Mokeona, Ill.

First, I claim the arrangement and combination of the twisted parts, B, with the lever, C, and standard, A, as set forth.

Second, The combination of the support, D, slide, L, and dasher rod, F, substantially as described.

57,795.—Process for Tanning.—J. N. Sturtevant and Harvey E. Jones, McGregor, Iowa.

We claim the within described process for tanning leather, when used substantially as herein specified.

57,796.—Plow.—George W. Thompson, Ripley, Ohio.

First, I claim the attaching of the mold boards, F* F*, to the standard, E, by means of the universal joint composed of the swivel bolt, a, and hinge or joint, b, substantially in the manner as and for the purpose set forth.

Second, The brace, F', applied to the beam, A, and land side, F, substantially as and for the purpose specified.

Third, The combination of the land side, F, standard, E, and the mold boards, F* F*, attached to the standard by the universal joint, substantially as and for the purpose set forth.

Fourth, The fastenings composed of the pivoted bars, G G, attached to the beam, A, substantially as and for the purpose specified.

57,797.—Rock-drilling Machine.—George Freeman Underhill, New York City.

First, I claim the divided frame work, A, hinged together, having the drill rod, H, arranged in its upper section, B, in combination with the clamping devices for securing the sections of the frame work together, substantially as and for the purpose described.

Second, The arrangement of the sliding or lifting frame, M, tappet shaft, q, and the polygonal-shaped drill rod, H, substantially as and for the purpose described.

Third, The eccentric, V, of shaft, q, yoke or collar, W, lever, Y, arm, A2, frame, B2, ratchet wheel, D2, and pawl, E2, when all arranged and combined together, so as to operate upon the drill rod, substantially in the manner and for the purpose specified.

Fourth, The use of rubber cushions upon the under side of the base portion of the frame work, for the purpose specified.

57,798.—Propelling Apparatus for Boats.—Maurice Vergnes, New York City. Antedated Aug. 3, 1866.

First, I claim the erection of the supporting arms, movable at base and apex, spread at the base for solidity and strength, in combination with the oar arms to guide, steady, and support them, in the manner and for the purpose described.

Second, Hinging the supporting arms upon a carriage set on rail, which can be moved to and fro to vary the dip of the oar in the water, and for the purpose of removing the oar from the water, in the manner described.

57,799.—Steam Engine.—George J. Washburn, Worcester, Mass.

I claim the arrangement in the diaphragm cylinder of the two pistons on the same rod, operated as described.

I claim in its arrangement with the double cylinder and pistons, the single valve controlling the steam openings, substantially as described.

I claim the arrangement of the valve chest, F, double cylinder, A A', and side chests or pipes, K L, the latter communicating, each by a single part, with the chest, F, and simultaneously, by duplicate parts, with the spaces on corresponding sides of the two pistons.

57,800.—Machine for Pressing Tobacco.—Wm. H. Watson, Yonkers, N. Y. Antedated Aug. 21, 1866.

I claim, First, The chain, 5, constructed and operating substantially as described for the purposes specified.

Second, I claim the pressing blocks, 36, constructed and operating substantially as described for the purposes specified.

Third, In combination with the chain, 5, constructed and operated substantially as shown, I claim the pressing blocks, 36, constructed and operating substantially as shown, for the purposes shown.

Fourth, The heating chambers, constructed and operating substantially as described for the purpose specified.

Fifth, In subjecting the tobacco or other substance to be pressed to the influence of heat while under pressure, as shown for the purposes designated.

57,801.—Whiffletree.—George Watt, Richmond, Va.

I claim, First, The construction of a double, single, or treble tree, so that it, by means of one or more of its bent sides, shall form an elastic connection between the draught animals and the object (wagon, plow, etc.), as described.

Second, The attachment of the double tree by its longest side to the plow beam, as and for the purpose described.

57,802.—Weeding Hoe.—W. J. Wells, Sidney, Ohio.

I claim the cross arm, D, having its button, F, and sides, G, beveled and pointed at its ends, substantially as and for the purpose described.

I also claim, in combination with the above, the side arm, E, for the purpose specified.

57,803.—Driving-rein Holder.—Milton Whipple, Medina, N. Y.

I claim the device herein described, consisting of the parts, A and B, constructed so as to operate substantially as described and designed for holding the driving reins of horses while temporarily leaving a carriage.

57,804.—Knife Sharpener.—Thomas H. White, Orange, Mass.

I claim the arrangement and combination of the circular disks, B B', with the stock, A, and the strap or hone, C, substantially as described and for the purpose set forth.

57,805.—Cooling Lard.—William J. Wilcox, New York City.

I claim the within described method of cooling lard, by passing over or through the same one or more impelled currents of cold air, substantially as and for the purpose described.

57,806.—Evener for Poles for Wagons, etc.—Henry F. Wilson, Elyria, Ohio. Antedated Aug. 15, 1866.

I claim the radial, c, and stationary pin or bolt, b, in combination with curved slot, a, and stationary pin, d, the whole being constructed in the manner and for the purpose set forth and described.

57,807. — Car Coupling. — George W. Wilson, Abingdon, Ill.

I claim constructing a car coupling of two double slotted blocks, A A, with hooks, b b, on one of the prongs, a a, of each block, fitting into corresponding grooves in the prongs, a' a', of the other block, combined with the shackle, c c, and the arms, f f, constructed, arranged and operated as and for the purposes herein described.

57,808.—Magazine Fire-arm.—O. F. Winchester, New Haven, Conn.

First, I claim constructing the tube or magazine, substantially in the manner described, so that the inner tube may be removed, in combination with the carrier, E, breech pin, L, and barrel, A as and for the purpose specified.

The combination of the stop, S, lever, H, and carrier block, E, when arranged to operate substantially as and for the purpose specified.

57,809.—Carriage Thill.—Benjamin L. Wood, Taunton, Mass.

I claim, as my invention, the improved shaft or pole connection as made with a hook, c, and an aperture, d, therein, arranged with the start bolt, a, and to receive a strap or its equivalent, as specified.

I also claim the arrangement of the safety strap, G, to pass through the aperture of the hook, as described.

I also claim the combination of a strap or its equivalent, to go through the eye of the hook, with such hook, and the shaft or its equivalent.

I also claim the arrangement and application of the anti-friction strap, I, with the shaft or its equivalent, and the hook, c, provided with an aperture, d, as and for the purpose described.

57,810.—Wagon Brake.—L. E. Woodard, Cohocton, N. Y.

I claim the combination of the eccentric, L, rod, m, pole H, and friction roller with the brake, e, bars, I I, when constructed for the purposes and substantially as herein described.

57,811.—Water Elevator.—Alfred Woodworth, North White Creek, N. Y.

I claim the pulley, E, keyed on one end of the windlass shaft, a, and having a cylindrical shell, F, placed over it, with a handle or crank, G, pivoted in the shell, and provided with a shoe, c, at its inner end within the shell, in combination with the pivoted bar or stop, H, on the curb, all arranged to operate substantially in the manner as and for the purpose set forth.

57,812.—Apparatus for Carbureting Gas.—Thomas D. Worrall, New York City.

First, I claim introducing into a gas pipe carbon spirit, for the purpose of enriching, purifying, or increasing the quantity of common gas, water gas, or common air.

Second, Introducing into a gas pipe fibrous material of any desired or suitable kind, for the purpose of drawing up or letting down carbon spirit, so as to vaporize said spirit, for the purposes set forth.

Third, The use of a large gas pipe, into which smaller ones conduct, or out of which they convey any kind of gas, so as to form a reservoir in which said gas can be detained for a long time, while being enriched by the vapors of carbon spirit or other carbonizing fluid.

Fourth, Inner casings of gas pipe of any desirable device, made to hold carbon spirit or other carbonizing fluids, and also to contain fibrous material for holding in suspension and vaporizing the same, while ordinary gas, water gas, or common air is passing through over or under them.

Fifth, The gas pipe, Fig. 1, with chamber in the bottom for holding any carbonizing material, for the purposes described.

Sixth, The gas pipe, No. 2, with chamber and fibrous material stretched horizontally along it, and from which the ends of other fibrous material drop into the carbonizing fluids, and convey them by capillary attraction to those stretched along it, for the purposes set forth.

Seventh, The gas pipe, No. 3, with holes drilled in or through the top, for the purpose of suspending wicking or other fibrous material that shall hang in carbon spirit, and drawing up said spirit, for the purposes set forth.

Eighth, The gas pipe, No. 4, in which strips of wood or wire run along the top of the pipe, on the inside, either across or in a longitudinal direction, for the purpose of holding wicking or other fibrous material, while the lower ends of the same are immersed in the spirit or fluid, for the purpose set forth.

Ninth, The gas pipe, No. 5, in which is inserted an inner casing or tube perforated with numerous holes, and through which cotton wicking or other suitable material is drawn, so as to form a perfect retina or net-work, in which the carbon vapors are thrown off, and through which any kind of gas may at the same time pass, for the purpose of being enriched or multiplied thereby.

Tenth, The gas pipe, No. 6, in which is contained a smaller perforated pipe or tube, around which and through which cotton or other fibrous material is passed, and over the whole of which a series of broad bands of wicking or a continuous apron is passed, for the purpose set forth.

Eleventh, The perforated tin or wire gauze inserted in a gas pipe for the purpose of distributing the gas to any or all parts of the pipe, as set forth.

Twelfth, Gas pipe, Fig. 8, with longitudinal partitions with or without coverings of fibrous material to insure that the gas to be enriched may run back and forth, for the purpose set forth.

Thirteenth, Gas pipe, Fig. 9, in which a series of partitions or chambers, each separate or all connected by apertures, is formed, and over which fibrous material is laid, in the manner and for the purpose described.

Fourteenth, Gas pipe, Fig. 10, with loop holes suspended from the top, through which cotton or other fibrous material may pass and be suspended in carbonaceous fluids, for the purposes set forth.

Fifteenth, Gas pipe, Fig. 11, in which is a spiral or screw-shaped pipe, cased or surrounded with fibrous material, around which gases and the vapor of carbonizing fluids may pass, for the purposes set forth.

Sixteenth, Gas pipe, Fig. 12, inside of which is a wire tube, around, along and across which fibrous material may be stretched and from which it may hang suspended, for the purposes set forth.

Seventeenth, The compound gas pipe, Fig. 13, two or more in any connected together, for the purpose set forth.

Eighteenth, Gas pipe, Fig. 14, in which several chambers are cast or otherwise constructed, so as to contain carbon spirit or other carbonaceous fluid, and in which said fluids may be transmitted from chamber to chamber by means of fibrous material, or in which in any other way the fluids may be vaporized, for the purpose described.

Nineteenth, The arrangement in combination with any of my devices of a gas burner, that can be turned and lighted under the reservoir, for the purpose set forth.

Twentieth, I also claim the use of each of the devices seen within the gas pipes, Fig. 5, Fig. 6, Fig. 9, Fig. 10, Fig. 11, and Fig. 14, for use in any other box or chamber, as well as in gas pipes.

57,813.—Eavestrough.—William Yapp, Cleveland, Ohio.

I claim the brace, B, with one end forming a loop and the other a lap, in which is formed a concave, e, in combination with the clamp, c, pivot, a, trough, A, and arm, D, in the manner and for the purpose, substantially as set forth.

57,814.—Lifting Jack.—A. Zink, Lancaster, Ohio.

I claim the shape and construction of the lever jack, when arranged with the shifting link and adjustable catch, as secured thereto, as herein described, and for the purposes set forth.

57,815.—Ditching Machine.—Jacob Ballard, New Antioch, Ohio, and Thomas J. Magee, Cincinnati, Ohio, assignors to themselves and Paul Hults, New Antioch, Ohio.

We claim, First, The arrangement of sliding mold boards, J, lower and upper guides, D and I, elevating mechanism, K L, and adjustable brace, P, or their mechanical equivalents, substantially as set forth.

Second, In the described combination the beam, A, sloping sheath, B, share, C, and the colters, G and H, as and for the purpose set forth.

Third, The clinometer attachment, W X, in combination with a supporting truck, T, and regulating screw, V, for the purpose explained.

Fourth, The shiftable handle, N, and ditch wheel, O, secured and operated as set forth.

57,816.—Railway Chair.—John W. Draper (assignor to himself and Arthur C. Stowell), Wilmington, Del.

I claim the combination of the plate, A, its beveled lugs, c c', cheeks, C C', and bolts, D D', the whole being constructed, arranged, and adapted to the rail, substantially as and for the purpose specified.

57,817.—Pruning Instrument.—Joseph Evans, Newark, N. J., and Bobert H. Seymour, Bloomfield, N. J., assignors to Henry Seymour, Elizabeth, N. J.

We claim constructing the cutting blade, C, with a groove, a, along its upper back edge, and so arranging in combination therewith, a cap or clamp, D, carrying a pin, b, that the blade will be guided so that it will operate upon the twig with a drawing cut in a direction from a bend in the hook, substantially as described.

Second, The spring lever, E E', in combination with the cutting blade of a pruning knife constructed and applied substantially as described, whereby the knife may be operated in a quick and easy manner.

Third, We claim the combin tion with each other of the diamond-shaped knife, C, hook, B, rod, F, and spring levers, E E', arranged and operating substantially as herein shown and described.

57,818.—Faucet.—John Fahrney (assignor to himself and Samuel Fahrney), Boonsboro, Md. Antedated Aug. 23, 1866.

I claim, First, The cylinder, A, with valve, H, in combination with piston, I, with its openings, a a, its rod, G, sliding through and turning in its center as shown at c d, and the circular plate, J, attached to end of the piston rod, as and for the purposes described.

Second, In combination therewith, the cut-off piston, F, neck, E, with its lower wall removed as shown at M, as and for the purposes described.

Third, The nut, H, with its projection, e, plate, L, and gage screws, f f, as and for the purposes described.

57,819.—Barrel Lifter.—Lucius H. Goff (assignor to Thomas C. Winslow), St. Albans, Vt.

I claim the barrel lifter herein described, the same consisting of a notched bar or lever, B, having hooks, C C, hung upon it, and moving under bands, D, or their equivalents, substantially as herein described and for the purposes specified.

57,820.—Whiffletree.—W. A. Harrall (assignor to himself and McCrellis Gray), Washington, Ind.

I claim the combination of the lever, H, spring, I, arm, G, spring, K, bar, J, band, D, and whiffletree, B, with each other and with the cross bar, a', of the thills, when said parts are constructed and arranged substantially as herein described and for the purpose set forth.

57,821.—Clasp for Holding Neckties and Shirt Collars Together.—Charles M. Hyatt (assignor to Lansingh and Osborne), Albany, N. Y.

I claim the within described attachment for securing the necktie to the collar consisting of the clip, A B, and of spurs, p, combined and arranged substantially as set forth.

57,822.—Molding.—Armon King (assignor to himself and John H. Chapman), Utica, N. Y.

I claim match plates constructed substantially as described and used in connection with patterns forming cores for sand molds, in the manner set forth.

57,823.—Piston for Steam Cylinder.—Mathew B. Mason (assignor to himself and George W. Harris), Aurora, Ind.

First, I claim the arrangement of the L-shaped packing rings, I I', and middle ring, J, as described and for the purpose specified.

Second, The grooved and perforated ring, G, constructed as and for the purpose specified.

Third, The double headed valves, H, constructed and arranged substantially as described and for the purpose specified.

57,824.—School Desk and Seat.—George Munger (assignor to J. W. Schermerhorn), New York City.

I claim as an article of manufacture, a desk consisting of the standards, A, brackets, a, both having their top edges dove-tailed, grooved seat, B, grooved top, C, grooved back strips, c, grooved shelf, E, with stops, f, constructed and combined as and for the purposes specified.

57,825.—Method of Receiving and Discharging Freight.—Newton A. Patterson (assignor to himself R. K. Byrd), Kingston, Tenn.

I claim, First, A frame bridge-way made in sections and provided with upper and lower tracks, D E, substantially as described and for the purpose set forth.

Second, The combination of the cars, G, constructed as described with the sectional bridge-way, and with the revolving cylinders, F, substantially as and for the purpose set forth.

57,826.—Portable Railroad.—Johann N. Peteler, Sheppach, Kingdom of Bavaria, assignor to Alois Peteler, New Brighton, N. Y.

I claim a portable railroad composed of sections, A, turnouts, B, supporting frames, C, bridges, D, crossings, E, and one or more turn tables, F, all constructed, combined and operating substantially as and for the purpose set forth.

Second, The combination of the perforated studs, a, and turn table, F, provided with rails, b, constructed and operating substantially as described, for the purpose specified.

57,827.—Machine for Boring Wells.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City, N. Y.

I claim, First, The adjustable clamp, I, in combination with the drum, C, and rising and falling pulley, J, constructed and operating substantially as and for the purpose described.

Second, The steam cylinder, M, and pulley, J, in combination with the calmp, I, and drum, C, constructed and operating substantially as and for the purpose set forth.

Third, The adjustable table, P, in the reservoir, N', in combination with the sand pump, O, constructed and operating substantially as and for the purpose described.

57,828.—Drill for Boring Wells.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City, N. Y.

I claim, First, The reamer, F, in combination with the drill rod, A, and cutters, C, constructed and operating substantially as and for the purpose set forth.

Second, The sleeve, F, with ratchet teeth, i i', in combination with the circular rack, j j', and drill rod, A, constructed and operating substantially as and for the purpose described.

57,829.—Coffin.—Julian A. Fogg, Stockport, Eng.

First, In the construction of coffins and burial cases, I claim the employment of the metallic corner pieces, joints, or connection, C, as described, whereby great durability and strength are given to the coffins or burial caskets, and a provision for an elaborate ornamentation of the same at little expense, substantially as specified.

Second, I claim as an improvement in coffins and burial cases the arrangement of the plate upon an edge of one of the sides or ends of the coffin or on a bracket or shelf secured thereto in such a manner that the plate will be visible whether the lid be open or closed, substantially as specified.

57,830.—Sand Pump.—Colin Mather, Manchester, Eng., assignor to Charles P. Button, New York City.

I claim the movable seat, b, clack, a, and rod, c, in combination with the barrel, A, and bucket, B, constructed and operating substantially as and for the purpose described.

57,831.—Water Wheel.—Pierre Francois Millott, Paris, France.

First, I claim the combination of a series of buckets open internally and externally to receive the water internally, in the manner described, upon each side of the arms, and discharge it externally, and a series of arms attached at or near the middle of said buckets, to allow the water to be introduced on both sides of them, and connecting said buckets to the shaft, as set forth.

Second, The combination of a series of buckets open as aforesaid to receive water internally and discharge it externally, with the shaft of the wheel and the arms, B B, the said arms, B B, being set at an angle to each other converging from points separated and distant from each other at the inner end to the middle of the bucket, as set forth.

Third, The arrangement in combination with a wheel adapted thereto of two separate spouts in such a manner as to discharge water into the interior openings between the buckets on each side of the arms of the wheel, substantially as described.

Fourth, The combination with the internally and externally open buckets to receive the water internally and discharge it externally, as described, of the projecting flange, e, to retain the water on its entrance into the buckets, as set forth.

57,832.—Coating Sheet Iron with Tin and other Metals.—Edmund Morewood, London, Eng.

First, I claim the slide, B, to receive the sheet or piece of metal to be coated, in combination with a receptacle, C, within the bath of coating metal to convey said sheet or piece of metal to the point of delivery, substantially as specified.

Second, I claim the delivery rollers, F, in combination with the receptacle, C, and an elevating apparatus to raise the sheets or pieces of metal to the delivery rollers, F, substantially as set forth.

Third, I claim wipers or rubbers, G, in combination with delivery rollers, F, to act upon the coating metal previous to the delivery of the sheet or piece of coated metal, for the purposes and as specified.

Fourth, I claim a slide or receptacle, in a bath of melted coating metal, to receive the sheets or pieces of metal at one place and convey them to a different place in said bath, where said sheets or pieces are delivered upward automatically from said bath, as set forth.

Fifth, In combination with an apparatus for coating sheets or pieces of metal, substantially as described, I claim a pair of delivery rollers, one of which is set in yielding bearings so as to provide for varying thicknesses of the sheets, or of the coating, as set forth.

57,833.—Cider Mill.—Hugh Sells, Vienna, Canada West.

I claim, First, The projections, h h, in combination with the case, B, forming the passages, i, substantially as and for the purpose specified and described.

Second, The dovetail-notched rings, G, substantially as described for the purpose specified.

57,834.—Apparatus for Trimming Ships.—William Louis Winans and Thos. Winans, London, England. Patented in England Dec. 21, 1863.

We claim the employment, for the purpose above described, of a movable weight, operated either by steam power, or hydraulic power, or by gearing connected with the propelling engines, as herein set forth.

57,835.—Coupling for Propeller Shafts of Ships.—William Louis Winans and Thomas Winans, London, England. Patented in England, June 20, 1863.

We claim coupling shafts by means of a block or plate, provided

with grooves, in which are inser'ed cross-pieces, or T-pieces, attached to the ends of the shafts to be coupled, as herein set forth.

57,836.—PROPELLER FOR SPINDLE-SHAPED SHIP.—William Louis Winans and Thomas Winans, London, England. Patented in England June 22, 1863.

We claim, as aforesaid, the application of two large screw propellers to spindle-shaped ships or vessels, in the manner and for the purposes herein set forth.

57,837.—SYSTEM OF CUTTING DRESSES.—Mrs. H. M. Carpenter, Grand Rapids, Mich.

I claim the use of the patterns, constructed and applied, as shown and described, for cutting dresses for women and children.

REISSUES.

2,347.—SALINOMETER.—Benjamin F. Bee, Harwich, Mass. Patented Jan. 9, 1866.

I claim, First, The combination in a salinometer of the closed transparent vessel (for containing the liquor to be tested) and a float for indicating the density of the liquid, these two operating substantially as set forth.

Second, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed transparent vessel, salinometer float, supply pipe, and escape pipe, all operating in the combination substantially as set forth.

Third, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, supply pipe, escape pipe, and air valve at the top of the vessel, all operating in the combination substantially as as set forth.

Fourth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, salinometer float, and guide for float, the salinometer, all operating substantially as set forth.

Fifth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, and closed case communicating therewith for the thermometer, both operating substantially as set forth.

Sixth, I also claim the combination in a salinometer of the following instrumentalities, viz: the closed vessel, salinometer float, and thermometer, all operating substantially as set forth.

Seventh, I also claim the combination in a salinometer of the closed vessel, with an escape valve, having the valve and screw independent of each other, so that the valve may be turned upon its seat to lighten the joint, substantially as set forth.

2,348.—HARVESTER.—M. Easterbrook, Jr., Geneva, N. Y. Patented May 22, 1866.

I claim, First, The combination of the hand lever, C, and two loose pinions, p and p', with the double pinion, b, and the spur wheel, B, arranged and operating substantially as and for the purposes set forth.

Second, The two loose pinions, p and p', whether they are adjusted with a hand lever or other suitable device, in combination with the double pinion, b, and the spur wheel, substantially in the manner and for the purposes shown and described.

Third, The arrangement of the pinions, p and p', upon a pivoted hand lever, substantially as shown in Fig. 3, having its axis or center of motion upon the counter shaft, as and for the purposes set forth.

Fourth, The employment of the pinion, b, of the counter shaft, made independent of the spur gear, B, and connected thereto when desired by one of two intermediate adjustable gear wheels, arranged and operating substantially as and for the purposes set forth.

2,349.—CONSTRUCTION OF CHURN BODIES.—J. C. Hills, Willoughby, Ohio. Patented May 24, 1864.

I claim the above-described construction of a churn body, consisting of the sides, A A, the sheet, A', groove, B B', bars, C C', and E, when constructed and arranged in the manner and for the purpose specified.

2,350.—MANUAL-POWER MACHINE.—Isaac C. Overpeck, Overpeck's Station, Ohio. Patented April 25, 1865.

I claim the two levers, d and e, moving simultaneously toward and from each other, when arranged to operate upon a center wheel, b, or its equivalent, substantially in the manner and for the purpose herein specified.

2,351.—SPINNING MACHINE.—William Earl, Jr., Nashua, N. H. assignee of Thomas Pye, New Hartford, N. Y. Patented Feb. 14, 1865.

I claim, First, The moving of the belt shifter, C, in a spinning machine, by the ordinary operation of the machine, at the point or time when the thread is fully twisted as desired, and the jack is about to be returned for the purpose of winding up the thread in such manner that the belt, R, is partially thrown on to the tight pulley, g, for the purpose of assisting the spinner in running up the jack and in making a tight bobbin, in the manner and by the means substantially as herein described and set forth.

Second, I claim the moving of the said belt shifter, C, by the ordinary operation of the machine, at the moment when the jack is nearly run up to the required or desired point or place for the piecing up of the thread, and just before it is fully wound upon the bobbins, in such manner that the said belt is thrown wholly off from the tight pulley aforesaid, and upon the said loose pulley, in the manner and by the means substantially as herein described and set forth.

Third, I claim the employment of the crooked lever, A, the oblique lever, B, and the angular lever, D, as arranged and combined, and then the whole in combination with the aforesaid belt shifter, C, in the manner and for the purposes substantially as herein described and set forth.

Fourth, I claim the employment of the chain, E, arranged and combined with the angular lever, D, and the slide bolt, F, in the manner and for the purposes substantially as herein described and set forth.

Fifth, I claim the combination of the slide bolt, F, with the coil or spiral spring, H, the bolt stock, G, and the shoe, b, and with a drop or sliding bar, d, each being arranged and combined in the manner and for the purposes substantially as herein specified, described, and set forth.

Sixth, I claim the drop or sliding bar, d, and the wire or cord, e, connected and combined with the faller, W, and with the shoe, b b', in the manner substantially as and for the purposes herein described and set forth.

Seventh, I claim the employment of the lever, A, having an oblique arm, v, in combination with the lever, n, and with the carriage of the jack aforesaid, by means of the arm or frame, L, containing the friction arm, M, each being arranged and operated in the manner substantially as and for the purposes herein specified, described, and set forth.

2,352.—HORSE RAKE.—C. W. Warner, Williston, Vt. Patented Nov. 15, 1864.

First, I claim the joints or hinges, b b, on arms, a a, projecting backward from the axle, A, in combination with the rake, G, all arranged as described to admit of the folding of the rake forward upon the thill bar, a*, substantially as set forth.

Second, The method substantially as described and represented of operating the rake by means of the combination of the foot triggers, K K', bar, J, and raking pawl, f g, with the notched bar, h, on the rake head.

"PRACTICAL HANDRAILING."—COPYRIGHT on sale for Eastern and Middle States. It is new and extremely simple. One plan adapted to all stairs. Two new and beautiful designs given. Single copies $5. Send for circular. Agents Wanted. WM. SALISBURY, Wheeling, West Va. 12 3*

LAST CENSUS OF THE UNITED STATES, giving the population of every State and County, and of the principal Cities, Towns, and Villages, with a Map of the United States.
Pocket size, flexible cloth cover. Sent by mail for 50 cents.
12 3*] G. W. & C. B. COLTON & CO.

WATER WHEELS.—THE HELICAL JOURNAL Turbine, for first-class mills, where great economy of water is desired. Simple, durable, and powerful. Manufactured by the patentee, J. E. STEVENSON, Hydraulic Engineer, 40 Dey street, New York.
☞ Practical Engineers wanted as Agents. 12 6*

BYRNE'S PRACTICAL MODEL CALCULATOR.
New Edition
INDISPENSABLE TO ALL MECHANICS AND ENGINEERS.

Just Published:

THE PRACTICAL MODEL CALCULATOR, For the Engineer, Mechanic, Machinist, Manufacturer of Engine work, Naval Architect, Miner, and Millwright. By Oliver Byrne. In one volume, 8vo, 591 pages. By mail free of pastage.....$4 50.

CONTENTS:—Weights and measures—of time, arithmetic, notation and numeration, rule of three, compound proportion; of common fractions, decimal fractions, duodecimals, involution, evolution; of ratios, proportions, and progressions; fellowship or partnership, simple interest; position, mensuration of superficies, decimal approximations, decimals equivalent to fractional parts of lineal measures; table of the circumferences, squares, cubes, and arcs of circles, from 1 to 100, advancing by a tenth; table of length of circular arcs, radius being ninety; table of areas of the segments and zones of a circle, of which the diameter is ninety, supposed to be divided into 1000 equal parts; rules for finding the area of a circular zone, etc.; table, etc., of the lengths of circular arcs; proportions of the lengths of semi-elliptic arcs; tables of reciprocals of numbers, or the decimal fractions corresponding to vulgar fractions, of which the numerator is ninety; weights and values in decimal parts; mensuration of solids, surfaces, and solidities of the regular bodies; table to facilitate the mensuration of timber; table of flat or board measure; table of cubic or solid measure; table showing the number of lineal feet of scantling of various dimensions, which are equal to a cubic foot; table containing the superficial and solid contents of spheres, from 1 to 12, advancing by a tenth; cuttings and embankments, slopes 1 to 1, slopes 1½ to 1, slopes 2 to 1; table of squares, cubes, square and cube roots of numbers 1 to 1600; rules for squares, cubes, square roots, etc.; table of the fourth and fifth powers of numbers, 1 to 150; table of hyperbolic logarithms—combination of algebraic quantities; the steam-engine—rules for portions of parts of land and marine engines; dimensions of parts of locomotives; tables of the pressure of steam in inches of mercury, at different temperatures; table of the temperature of steam at different pressures in atmospheres; table of expansion of air by heat; strength of materials; results of experiments on the strength and other properties of cast iron; table of the cohesive power of bodies whose cross-sectional areas equal one square inch; center of gravity; centripetal and centrifugal forces; center of gyration; pendulums; conical pendulum; the temperature and elastic force of steam; the motion of elastic fluids; motion of steam in an engine; of the ascent of smoke and heated air in chimneys; table of experiments on steam boilers; table of the comparative evaporative power of different kinds of coal; strength of boilers; table showing the diminution of strength of copper boiler plates by addition to the temperature; table of experiments on iron boiler plates at high temperature; area of steam passages; loss of force by the decrease of temperature in the steam pipes; feed water; condensing water; safety valves; the slide valve; spherical condition of water in boilers; expansion, friction; expanded steam—mean pressure at different densities, and rate of expansion; horse-power; parallel motion; table of nominal horse-power of low pressure engines; table of nominal horse-power of high-pressure engines; strength of rods; formulas for the strength of various parts of marine engines; dimensions of the several parts of furnaces and boilers; effective heating surface of flue boilers; effective heating surface of tubular boilers; mechanical power of steam; indicator; weight combined with mass, velocity, force, and work done; strength of materials; on material employed in the construction of machines; tables of the mechanical properties of the materials most commonly employed in the construction of machines and framing; the cohesive strength of bodies; on torsion and twisting; table of the proportionate length of bearings on journals for shafts of various diameters; table of tenacities, resistance to compression, and other properties of the common materials of construction; comparative strength and weight of ropes and chains; alloys that are of greater tenacity than the sum of their constituents; table of elasticity and strength of various species of timber; rules for finding the strength of timber and iron; table showing the weight or pressure a beam of cast iron will sustain; resistance of bodies to flexure by vertical pressure; dimensions of cylindrical columns of cast iron to sustain a given load or pressure with safety; elasticity of torsion; relative strength of metals to resist torsion; deflection of rectangular beams; table of the depths of square beams or bars of cast iron, calculated to support 1 cwt. to 14 tuns, in the middle; of friction; table of results of experiments on the friction of unctuous surfaces; table of results of experiments on friction with unguents interposed; table of results of experiments on the friction of gudgeons or axle-ends in motion upon their bearings; table of coefficients of friction under pressures increased continually up to limits of abrasion; experiments made by M. Morin on the stiffness of ropes; experiments of M. Morin on the traction of carriages, and the destructive effects which they produce on roads. Hydraulics—the discharge of water by simple orifices and tubes; the discharge by different apertures and tubes, under different heads of water; discharge by compound tubes; discharge by conduit pipes; discharge by weirs and rectangular apertures. Water Wheels—the overshot wheel; the turbine wheel. Windmills—results of experiments on the effect of windmill-sails in grinding corn. The Application of Logarithms, Trigonometry of Hights and Distances, Spherical Trigonometry, Measurement of Angles, Gravity, Weight, Mass,—table of hights corresponding to different velocities in feet the second; specific gravity; table of specific gravity of various substances; table of the weight of a foot in length of flat and rolled iron; table of the weight of cast iron pipes in length; table of the weight of one foot length of malleable iron; surface and solidity of spheres; table of the weight of flat bar iron, 1 foot in length, of various breadths and thicknesses; table of the specific gravities and other properties of bodies; table of the weight of columns of water; table of the weight of square bar iron, from 1 to 10 feet in length, and from ¼ to 6 inches square; table of the weight of a square foot of sheet iron; table of the weight of a square foot of boiler-plate iron from ⅛ to 1 inch thick; table of the weight of round bar iron, from 1 to 10 feet in length, and from ¼ to 6 inches diameter; table of the weight of cast iron plates, per superficial foot, from ⅛ to one inch thick; table of the weight of cast iron pipes 1 foot in length; table of the weight of solid cylinders of cast iron, 1 foot in length, and from ¼ to 14 inches diameter; table of the weight of a square foot of copper and lead, from 1-32 to ½ an inch in thickness; table for findingthe weight of malleable iron, copper, and lead pipes 12 inches long, etc.; table of the weight of a square of mill board; table of the weight of wrought iron bars 12 inches long; table of the proportional dimensions of 6-sided nuts for bolts, from 1-4 to 2¼ inches diameter; table of specific gravity of water at different temperatures; table of weight of cast iron balls from 1 to 12 inches diameter; table of the weight of flat bar iron 12 inches long. Brass—weight of a lineal foot of round and square. Steel—weight of one foot of round steel; tables of the weights of rolled iron, per lineal foot, of various sections, with illustrations; table of natural sines, co-sines, tangents, co-tangents, secants, and co-secants, to every degree in the quadrant. Moment of Inertia—weight, acceleration, and mass; principles and practical application of mechanical powers. Continuous Circular Motion; table of change wheels for screw cutting; table by which to determine the number of teeth or pitch of small wheels; table of the diameters of wheels at their pitch circle to contain a required number of teeth at a given pitch; table of the strength of the teeth of cast iron wheels at a given velocity. Additional examples on the velocity of wheels, drums, pulleys, etc.; on the maximum velocity and power of water wheels; of pumps and pumping engines; centripetal and centrifugal force; shipbuilding and naval architecture, with various calculations of dimensions, displacement, etc., etc. Tables of Logarithms.

☞ My New Catalogue of Practical and Scientific Books, complete to July 1, 1866, will be sent free of postage to any one who will favor me with his address.
HENRY CAREY BAIRD,
Industrial Publisher,
12 1] 406 Walnut street, Philadelphia.

SAW MILLS.—BROWN Bro.'s CIRCULAR Saw Mills, with Stearn's Patent Eccentric Sets, far superior to Rack and Pinion and Screw Sets. No time lost in setting. These Mills are extensively used and much preferred by the best lumbermen in Pennsylvania and Michigan. For sale by
J. E. STEVENSON, Engineer,
12 6*] 40 Dey street, New York.

MACHINERY AND MACHINISTS' TOOLS, of all kinds, including the LEONARD & CLARK PREMIUM LATHE. Also, Steam Engines, Saw Mills, Wood Cutting Machinery, etc., etc. Steamboat and Machinery Repairing at the
12 1*] QUASSAICK MACHINE SHOP, Newburgh, N. Y.

BAIRD'S PRACTICAL AND SCIENTIFIC BOOKS.
LIST NO. 6.

Kentish.—A Treatise on a Box of Instruments, and the Slide Rule; with the Theory of Trigonometry and Logarithms, including Practical Geometry, Surveying, Measuring of Timber, Cask and Malt Gaging, Hights and Distances. By Thomas Kentish. In one volume, 12mo.....$1 25.

Larkin.—The Practical Brass and Iron Founder's Guide: A Concise Treatise on Brass Founding, Molding, the Metals and their Alloys, etc.: to which are added Recent Improvements in the Manufacture of Iron, Steel, by the Bessemer process, etc., etc. By James Larkin, late Conductor of the Brass Foundery Department in Reaney, Neafie & Co.'s Penn Works, Philadelphia. Fifth edition, revised, with Extensive Additions. In one volume, 12mo.....$2 25.

Lieber.—Assayer's Guide; or, Practical Directions to Assayers, Miners, and Smelters. By Oscar M. Lieber. 12mo, cloth.....$1 25.

Love.—The Art of Dyeing, Cleaning, Scouring, and Finishing, on the Most Approved English and French Methods: being Practical Instructions in Dyeing Silks, Woolens, and Cottons, Feathers, Chips, Straw, etc.; Scouring and Cleaning Bed and Window Curtains, Carpets, Rugs, etc.; French and English Cleaning, any Color or Fabric of Silk, Satin, or Damask. By Thomas Love, a Working Dyer and Scourer. In 1 vol. 12mo.$3 00.

Lowig.—Principles of Organic and Physiological Chemistry. By Dr. Carl Lowig. Translated by Daniel Breed, M.D. 8vo sheep.....$3 50.

Main and Brown.—The Marine Steam Engine. By Thomas J. Main, Professor of Mathematics, Royal Naval College, and Thomas Brown, Chief Engineer, R. N. Illustrated by engravings and wood-cuts. 8vo, cloth.....$5 00.
☞ THE TEXT BOOK OF THE U. S. NAVAL ACADEMY.
CONTENTS:—Introductory chapter—the boiler; the engine; getting up the steam; duties to machinery when under steam; duties to machinery during an action or after an accident; duties to engine, etc., on arriving in harbor; miscellaneous; appendix.

Main and Brown.—Questions on Subjects Connected with the Marine Steam Engine, and Examination Papers; with hints for their Solution. By Thomas J. Main, Professor of Mathematics, Royal Naval College, and Thomas Brown, Chief Engineer, R. N. 12mo, cloth.....$1 50.

Main and Brown.—The Indicator and Dynamometer, with their Practical Applications to the Steam Engine. By Thomas J. Main and Thomas Brown. With Illustrations..$1 50.

Makins.—A Manual of Metallurgy, more particularly of the Precious Metals, including the Methods of Assaying them. Illustrated by upward of 50 engravings. By George Hogarth Makins, M.R.C.S., F.C.S., one of the Assayers to the Bank of England; Assayer to the Anglo-Mexican Mints; and Lecturer upon Metallurgy at the Dental Hospital, London. In one vol., 12mo.....$3 50.
CONTENTS:—General properties of the metals; general view of the combining properties of the metals; combination of metals with the non-metallic elements; of metallic salts; of heating apparatus, furnaces, etc.; of fuels applicable to metallurgic operations; metals of the first class; metals of the second class; the principles of electro-metallurgy.

Marble Worker's Manual: Containing Practical Information respecting Marbles in general, their Cutting, Working, and Polishing; Veneering, etc., etc. 12mo, cloth.....$1 50

The above or any other of my Practical and Scientific Books sent by mail, free of postage, at the publication price.
☞ My New and Revised Catalogue of Practical and Scientific Books sent free of postage to any address.
HENRY CAREY BAIRD,
Industrial Publisher,
12 No. 406 Walnut street, Philadelphia

INCRUSTATIONS IN STEAM BOILERS.—Temple's Liquid removes and prevents Scale from forming. Prevents Corrosion of the Iron. Price reduced. Address
12 3*] A. TEMPLE, Bridgeport, Conn.

A FIRST-CLASS STEAM ENGINE AND boiler, 40 horse-power, with circular sawmill, all nearly new, complete, and in perfect order, ready for shipment. For sale very low for cash. Address E. M. A.,
1*] Box 1,148, Richmond, Va.

KEENER'S PATENT ELLIPTIC HAT RACK, for hanging hats, etc., so as to render it impossible for them to fall. (Illustrated on page 182.) Rights for sale. Apply to
CHAS. H. KEENER,
12 3] 238 Madison Avenue, Baltimore, Md

FOR SALE.—THE VALUABLE PATENT Right of the Excelsior Refrigerator and Provision Safe combined, together with $800 worth Stock Patterns, etc. etc., from which $15,000 can be made annually. Call on or address
1*] BONNER & KNOWD, 71 West Broadway.

TO MANUFACTURERS.—WM. L. AVERY, Broker for Manufacturers and Consumers, Maryland Building, Baltimore, orders merchandise direct. Transactions, Cash. The sale of patent rights negotiated. 1*

ONE THOUSAND AGENTS WANTED TO sell the celebrated American Washing and Wringing Machines, acknowledged to be the most practical and perfect of the kind ever invented. Both upon new principles. Agents may make from two to three hundred dollars per month.
Address, with stamp, AMERICAN WASHING AND WRINGING MACHINE CO.,
1*] 87 Park Row, New York.

C. B. CROSSMAN, COMMISSION AGENT for the purchase and sale of Steam Engines, Machinery, Machinists' and Manufacturers' Materials and Findings of all descriptions. Information given gratis on all subjects connected with Machinery. Strangers coming into the city can purchase, through this agency, whatever they may need in machinery and mechanical appliances or material, at manufacturers' prices, without loss of time or annoyance. Orders by mail promptly attended to. Satisfaction guaranteed in all cases.
CHARLES B. CROSSMAN,
12] No. 40 Cortlandt street, New York.

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, N. Y. 1 tf

WOODWORTH PLANERS, BARLETT'S Patent Power Mortise Machine, the best in market. Woodworking Machinery, all of the most approved styles and workmanship. No. 24 and 26 Central, corner Union street, Worcester, Mass. [4 11*] WITHERBY, RUGG & RICHARDSON.

R. BALL & CO.,
SCHOOL STREET, WORCESTER, MASS.,
Manufacturers of Woodworth's, Daniell's, and Gray & Wood's Planers, Sash Molding, Tenoning, Mortising, Upright and Vertical Shaping, Boring Machines, Scroll Saws, and a variety of other Machines and articles for working wood.
Send for our Illustrated Catalogue. 1 51*

LATHES, PLANERS, AND OTHER TOOLS, on hand and to order, from Lowell Machine Shop.
STEVENSON & PEIRSON,
6 13*] 48 Kilby street, Boston.

PORTABLE STEAM ENGINES, COMBINING The maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & Co., Lawrence, Mass. 1 tf

WOOD PLANERS, MOLDING MACHINES, and all kinds of wood-working machinery, in store and for sale by J. B. FULLER, No. 8 Dey street, New York. 9 4]

WHITE'S GOVERNOR VALVE.—RIGHTS in Wisconsin and Minnesota for sale by P. RANSOM, Galesburg, Ill. 9 6*

STEAM ENGINES—PORTABLE & STATIONary—all sizes, with or without boilers, 2 to 300 horse-power, new and second-hand, for sale low by J. B. FULLER, No. 8 Dey street, New York. 9 4]

BLANCHARD'S, and KNIGHT'S, and JENkins's Spoke Lathes, and a large lot of Wheel Machinery, of all descriptions, Belting, etc., new and second-hand, for sale low by J. B. FULLER, No. 8 Dey street, New York. 9 4]

ATMOSPHERIC TRIP HAMMERS ARE made by CHAS. MERRILL & SONS, 556 Grand street, New York. They will do more and better work, with less power and repairs, than any other Hammer. Illustrated circulars, giving full particulars, sent on application. tf 9

ENGINE LATHES, PLANERS, DRILLS, shafting, pullies, hangers, scroll and screw chucks, Stubbs's twist drill sockets and drill chucks, portable forges, anvils, vises, and a large stock Machinists' and Blacksmiths' tools, new and second-hand, in store and for sale low by J. B. FULLER, No. 8 Dey street, New York. 9 4]

WANTED.—SOME ONE TO TAKE AN INterest in and manufacture a new Sewing Machine—just patented. Makes the Lock-stitch, without rewinding; also, several other kinds of stitches, warranted to compete with, if not surpass any machine out. Address G. L. DULANEY, Mechanicsburg, Pa 9 5*

PAGE'S GRATE, WATER, FLAME, AND Coal Lime Kiln, on new and scientific principles. Great saving. Fuel, hard or soft coal, peat, or wood. Warranted to burn best finishing lime. Both new and patented 1864, 1866. Rights for sale. C. D. PAGE, Rochester, N. Y. 9 6*]

SCHLENKER'S
IMPROVED BOLT CUTTER.
Late improvements make this the most perfect Bolt Cutter in the maaket. No running back off the thread; dies cheap and easily kept in order. The Cutter Head may be used on the ordinary lathe, and is successfully used on some of the best Bolt Cutters heretofore in use. Nut taps on hand and made to order. Lathes, improved Shaping Machines and Drills on hand and made to order. Send for circular. Address
W. S. SHAW, General Agent, or
R. L. HOWARD, Manufacturer,
Buffalo, N. Y. 9 4*]

T. N. HICKCOX,
Manufacturer of
STAMPED AND PRESSED BRASS GOODS,
Plain and Fancy Brass Caps for Pomatum and Mucilage Bottles, Brass Baggage and Key Checks, Stove Ornaments, Brass Labels for Oil Cans, House Furnishing Goods, Insurance Companies, etc. Steel Dies of any Design Required. Presses and Light Machinery manufactured to order. Prompt attention paid to articles of new manufacture and Patent Goods; Models for the Patent Office neatly executed. Salesroom, 280 Pearl-st., N. Y.; Factory, corner John and Pearl-sts., Brooklyn. 9 4*

FRENCH BURR STONE PAINT MILLS—all sizes. Brainard's Iron Power and Hand Paint Mills. HOLMES & BLANCHARD, Boston, Mass. 8 10*]

BROWN'S FRENCH Burr Portable Grist Mills, all sizes. [8 10*] HOLMES & BLANCHARD, Boston, Mass.

FOR ENGINE BUILDERS' AND STEAM Fitters' Brass Work, address F. LUNKENHEIMER, Cincinnati Brass Works. 8 26*]

THE HARRISON BOILER—A SAFE STEAM BOILER.—This new Steam Generator combines essential advantages in Absolute Safety from explosion, in first cost and cost of repairs, durability, economy of fuel, facility of cleaning, and transportation, not possessed by any other boiler.

It is formed of a combination of cast-iron hollow spheres—each 8 inches in external diameter, and ⅜ths of an inch thick, connected by curved necks. These spheres are held together by wrought iron bolts with caps at the ends. The form is the strongest known. Its strength to resist internal pressure is very great—unweakened as it is by punching or riveting, which lessens the strength of the wrought iron boiler plate about forty per cent. Every boiler is tested by hydraulic pressure at 400 pounds to the square inch. It cannot be burst under any practicable steam pressure.

Under pressure which might cause rupture in ordinary boilers every joint in this becomes a safety valve. No other steam generator posseses this property of relief under extreme pressure without injury to itself, and thus preventing disaster.

It is not affected by corrosion, which soon destroys the wrought iron boiler. Most explosions occur from this cause. It has economy in fuel equal to the best boilers, arising from the large extent and nearness to the fire of its heating surface, as also from the waved line of this surface which, thoroughly mixing the gases, induces better combustion, and breaking the flame, causes the heat to be more effectually absorbed than in the ordinary tubular or cylinder boiler.

It gets up steam quickly, and with little fuel. It produces superheated steam without separate apparatus, and is not liable to priming or foaming.

It is easily transported, and may be taken apart so that no piece need weigh more than eighty pounds. In difficult places of access, the largest boiler may be put through an opening one foot square. It is readily cleaned inside and out. Under ordinary circumstances, it is kept free from permanent deposit by blowing the water entirely out, under full pressure once a week. It requires no special skill in its management. Injured parts can be renewed with great facility, as they are uniform in shape and size. When renewed the entire boiler remains as good as new. The greater part of the boiler will never need renewal unless unfairly used.

A boiler can be increased to any extent by simply adding to its width, and being the multiplication of a single form, its strength remains the same for all sizes. It has less weight, and takes less than one-half the ground area of the ordinary cylinder boiler, without being increased in hight.

Any kind of fuel may be used under this boiler, from the most expensive to refuse coal dust.

Drawings and Specifications free of charge. For descriptive circulars or price address JOSEPH HARRISON, JR., Harrison Boiler Works, Gray's Ferry Road, Adjoining U. S. Arsenal, Philadelphia. 9 13*

STEAM BOILER EXPLOSIONS PREVENTED by use of Ashcroft's Low Water Detector. Over 5,000 in use. Send for Circular. JOHN ASHCROFT, 50 John st., N. Y. 26 12*

TWENTY-FIVE PER CENT OF THE COST of Fuel Saved annually by the use of Hair and Wool Felt as applied and for sale by JOHN ASHCROFT, 50 John street, New York. Send for Circular. 26 12*

THE NONPARIEL WASHING MACHINE.—"A First-class Machine—one that has no rival to our knowledge."—Scientific American.
Send for free descriptive circular to.
OAKLEY & KEATING,
184 Water street, New York. 8 11*]

15,000 lbs. CAST and MALLEABLE PIPE fitting for steam, gas, and water; 5,000 lbs. small malleable fittings for gas fitters; wrought and cast pipe iron and brass cocks; globe check valves, gage cocks, steam and water gages, and a large stock of steam and gas fitter's goods and tools, for sale low by J. B. FULLER, No. 8 Dey street, New York. 9 4]

PATENTED WOOD-BENDERS, FOR FELlies, Furniture, Agricultural Implements, etc. Machines with rights to use, for sale. JOHN C. MORRIS, No. 122 East Second street, Cincinnati, Ohio. 9 6*

ENGINEERS, SURVEYORS, MACHINISTS, Draftsmen, School Teachers, send for the Descriptive Manual of Mathematical Instruments and Drafting Materials, a pamphlet of 112 pages, published and sent free by JAMES W. QUEEN & CO., Mathematical Instmt. Makers, 924 Chestnut-st., Phila. [9 10*

LARGE ENGINE & BOILERS FOR SALE.—Horizontal Engine, 20x24, cylinder very heavy construction, 14 feet fly wheel; 4 Boilers 36 in. diameter, 20 ft. long, 2 13-in. flues each, and steam drums, built of charcoal iron, with all fittings, all in first-class order, and ready for immediate delivery. For sale low by J. B. FULLER, No. 8 Dey street, New York. 9 4]

THE STEAM SIPHON PUMP IS THE MOST simple, direct, and effective device for raising water by steam yet discovered. It is an independent lift and force pump, without piston, plunger, valves, or any movable part. It cannot get out of order, or freeze up, and can be used wherever there is a steam boiler, either with high or low pressure. It is an efficient fire engine, and the best bilge pump known. Address
STEAM SIPHON COMPANY,
48 Dey street, New York. 9 13*

BARREL MACHINERY.—THE AMERICAN Barrel Machine Co. now offer for sale their new and improved machinery for the manufacture of staves for all descriptions of casks, on such terms as will bring it within the means of the smallest cooper. These machines are now in use at South Boston by the "Downer Kerosene Oil Co.," in the manufacture of Merrill's patent grooved barrel, where they may be seen in full operation. Address
AMERICAN BARREL MACHINE CO.,
151 Devonshire street, Boston. Post-office Box 3,219. 9 4*]

MACHINISTS' TOOLS FOR SALE.—3 Iron Planers, 15 feet, 36x36; 10 feet, 40x36; 5 feet, 20x18. These have been used about 6 months. 3 Engine Lathes, 10 feet 17 in. swing, 10 feet 20 in. swing, 10 feet 25½ in. do. For particulars and cuts address STEPTOE, McFARLAN & CO., Cincinnati, Ohio.

WOODWORTH PLANERS.—
MESSRS. STEPTOE, McFARLAN & CO.,—Gent'emen:—We are highly pleased with the Woodworth Planer and Matcher, purchased from you, and think it superior to any machine of the kind of which we have any knowledge.
WEARY, SNYDER WILCOX & CO.,
July 27, 1866. Akron, Ohio.
☞ Send for circular and price lists.
STEPTOE, McFARLAN & CO.,
9] Cincinnati, Ohio.

ANDREWS'S PATENT PUMPS, ENGINES etc.—
CENTRIFUGAL PUMPS, from 90 Gals. to 40,000 Gals. per minute, capacity.
OSCILLATING ENGINES (Double and Single), from 2 to 250 horse-power.
TUBULAR BOILERS, from 2 to 50 horse-power, consume all smoke.
STEAM HOISTERS, to raise from ½ to 6 tuns.
PORTABLE ENGINES, 2 to 20 horse-power.
These machines are all first-class, and are unsurpassed for compactness, simplicity, durability, and economy of working. For descriptive pamphlets and price list address the manufacturers,
W. D. ANDREWS & BRO.,
No. 414 Water street, N. Y 3 tf]

AMERICAN PEAT COMPANY.—THIS COMpany, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use.
1 12* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

IRON PLANERS, ENGINE LATHES, DRILLS, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address 2tf] NEW HAVEN MANUFACTURING CO., New Haven, Ct.

"POWER-LOOM WIRE CLOTHS" AND nettings, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton. Mass. 1 36*

MODELS, PATTERNS, EXPERIMENTAL and other Machinery, Models for the Patent Office, built to order by HOLSKE & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 1 tf

OXY-HYDROGEN STEREOPTICONS,
OXY-CALCIUM STEREOPTICONS,
DISSOLVING LANTERNS,
MAGIC LANTERNS, Etc., Etc.
A Large Assortment of American, European, and Foreign Photograph Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 pages, will be sent free by Mail on application.
WILLIAM V. McALLISTER,
21 52* 728 Chestnut street, Philadelphia.

10,000 AGENTS WANTED, IN EVERY TOWN, COUNTY, and STATE, to sell Topliff's Patent Perpetual Lamp Wick. Needs no Trimming. Sample sent for 20c; two for 30c. State and County Rights for Sale.
MURPHY & COLE,
3 tf] 81 Newark Avenue, Jersey City, N. J.

PLATINUM, IN ALL FORMS, FOR ALL Purposes, wholesale and retail. H. M. RAYNOR, Importer, 748 Broadway, New York. Scrap and Ore purchased. 9 cow2*

CLOCKS FOR TOWERS, OFFICES, ETC., also Glass Dials for illuminating. Address
7 13* cow] JOHN SHERRY, Oakland Works, Sag Harbor, N. Y.

ENGINE AND BOILER FOR SALE.—Boiler 40 in. diameter, 20 ft. long, two 15-in. flues, stack 40 ft. long. Engine 9¾ bore, 24-in. stroke. Surface cock, pipes, and all in good running order. Also, a 12 horse-power Engine. Address
J. W. MOUNT,
8 4 cow*] Medina, Orleans county, N. Y.

ALCOTT'S CONCENTRIC LATHES.—FOR Broom, Hoe, and Rake Handles, Chair Rounds, &c., and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, 13 Platt street, New York. b

FOR PATENT STAVE AND BARREL MAchinery, Shingle Machines, Etc., address J. A. FAY & CO., Cincinnati, Ohio. 4btf

SMITH'S PATENT FUSIBLE SAFETY VALVE OR PLUG.—These Plugs are in extentive use in England, and are the best application of fusible alloy, for safety from accidents by low water or over pressure; are self-acting, and cannot be tampered with. For sale by
CHARLES W. COPELAND, No. 171 Broadway,
9 8] Sole Agent for the United States.

SAVE YOUR FUEL.—CARVALHO'S IMPROved Steam Super-heater (easily attached to any boiler), prevents "priming," and furnishes pure steam to the engine, saving 25 per cent of fuel. It will also supply dry steam, for heating or drying purposes. Agents wanted in Pennsylvania, Ohio, and Illinois.
For circulars, etc., address HENRY W. BULKLEY,
9 4*] 37 Broadway, New York.

MASON'S PATENT FRICTION CLUTCHES, for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by
6 tf VOLNEY W. MASON, Providence, R. I.

WROUGHT IRON TACKLE BLOCKS—all sizes. Also, Doyle's Patent Hoisting Machines, on hand, for sale by LEACH BROTHERS,
5 13] 102 Liberty street, New York.

WATER WHEELS.—
Warren's American Turbine Wheel is extensively taking the place of other wheels throughout the country, where great power, and the saving of water is required. Address
A. WARREN, Agent American Water Wheel Co.,
5 12*] 31 Exchange street, Boston, Mass.

STEAM ENGINES AND BOILERS.—
THE ALBERTSON & DOUGLASS MACHINE CO.,
New London, Conn.,
have on hand, and are now building, Engines of 8, 10, 11, 12, 14 and 16 inches diameter of Cylinder. Latest improved Circular Saw Mills. Cotton Gins for Hand and Power. Steam Boilers of any size made to order. 5 7*

AMERICAN EMERY.—GUARANTEED SUperior to any other Emery in the market. F. K. Sibley's Emery Cloth, covered with American Emery, superior to any other. By F. W. BACON & CO., 84 John street,
Sale agents for New York City. 1 12*

THE AMERICAN VISE—A WELL-CONstructed Parallel Vise, recently Patented—a great improvement on all others. All sizes on hand, by F. W. BACON & CO., 84 John street, Sale Agents, New York City. 1 12*

LENOIR PATENT GAS ENGINES,—WITHout fire, coal, smoke, or noise. Operated by petroleum, or coal gas. Ignited within the cylinder by the electric spark. Half-horse to four-horse power, for pumping, sawing, turning, hoisting, grinding, etc. With portable gas generators for farms and plantations. Manufactured exclusively at the
LENOIR GAS ENGINE WORKS,
26 10* 435 East Tenth street, near Avenue D, New York.

ANDERSON & SCHERMERHORN, PATENT and Model Makers, Gearing Cocks, Valves, and Engines. Patterns of every description. Rear No. 47 Ann street, New York, second floor. 11 tf

MORSE'S Patent TWIST DRILLS, CHUCKS, SOCKETS, etc.
A full assortment may be found in New York at F. W. Bacon & Co.'s, 84 John street; Peter A. Frasse, 95 Fulton street; Nathusin, Kugler & Morrison, 229 Bowery. In Boston, at A. J. Wilkinson & Co.'s, No. 2 Washington street; May & Co.'s, No. 1 Broad street. In Philadelphia, Wm. P. Walter & Son's, 1,233 Market street. In Hartford, at Francis & Gridley's, 343 Main street. In San Francisco, at Marsh, Pilsbury & Co.'s, corner Pine and Front streets. In London, England, at Keith & Co.'s, 16 ½ Fenchurch street, and at the Factory, corner Fourth and Bedford streets, New Bedford, Mass. 1*

WOOD & MANN STEAM ENGINE CO.'S CELEBRATED PORTABLE STEAM ENGINES, from 4 to 35 horse-power. Also, PORTABLE SAW MILLS.
We have the oldest, largest, and most complete works in the United States, devoted exclusively to the manufacture of Portable Engines and Saw Mills, which, for simplicity, compactness, power, and economy of fuel, are conceded by experts to be superior to any ever offered to the public.
The great amount of boiler room, fire surface, and cylinder area, which we give to the rated horse-power, make our Engines the most powerful and cheapest in use; and they are adapted to every purpose where power is required.
All sizes constantly on hand, or furnished on short notice. Descriptive circulars, with price list, sent on application.
WOOD & MANN STEAM ENGINE CO.,
7 52] Utica, N. Y. Branch office, 96 Maiden Lane, N. Y. City.

$200 per MONTH is MADE by AGENTS selling the Parker Sewing Machine—the most perfect in existence. Parker Sewing Machine Company, Cincinnati, Ohio. 8 13

IMPORTANT.
MOST VALUABLE MACHINE for all kinds of irregular and straight work in wood, called the Variety Molding and Planing Machine, indispensable to competition in all branches of wood-working. Our improved guards make it safe to operate. Combination collars for cutters, saving 100 per cent, and feed table and connection, for waved moldings and planing, place it above all others. Evidence of the superiority of these machines is the large numbers we sell, in the different states, and parties laying aside others and purchasing ours, for cutting and shaping irregular forms, sash work, etc.
We hear there are manufacturers infringing on some one or more of our nine patents in this machine. We caution the public from purchasing such.
All communications must be addressed "Combination Molding and Planing Machine Company, No. 211 East 22d-st., New York," where all our machines are manufactured, tested before delivery, and warranted.
Send for descriptive pamphlet. Agents solicited. 10 6*

PEW AND SEAT HAT RACK—FOR SALE, the entire and undivided right to Blake's Patent Pew and Seat Hat Rack. If not sold entire by the 15th proximo, the patentee will then dispose of Rights to the States, severally. Competent judges say that this Rack will prove one of the most popular and best selling inventions ever offered to the public. It exactly and happily meets what has long been felt to be a positive and troublesome want. By investing in a right, even to a single State men of moderate means will find here an opportunity to make a few thousand dollars, promptly, easily, agreeably, usefully. For Circulars stating terms, etc., address, E. S. BLAKE, Pittsburgh, Pa. 10-3*]

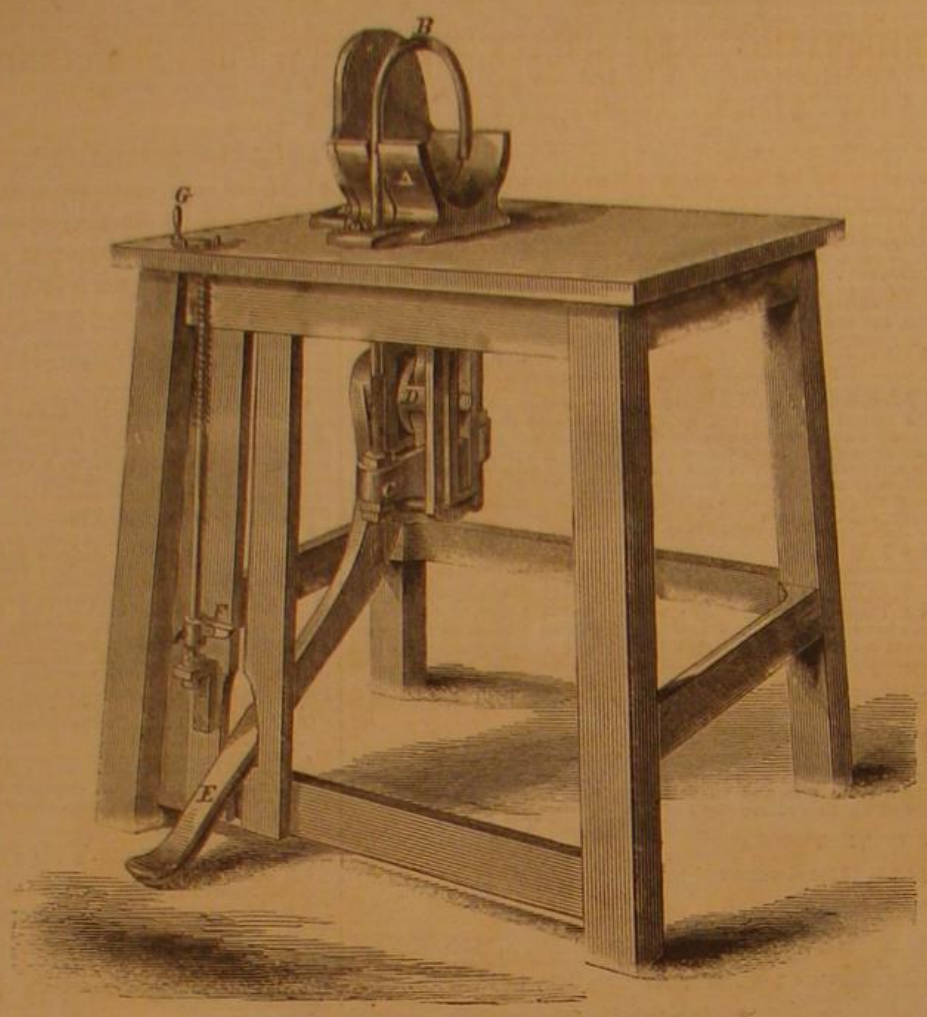
MANUFACTURERS AND INVENTORS.—PACIFIC PATENT AGENCY, for opening facilities to Manufacturers and Inventors to introduce their products to the public in the departments of Mining, Mechanics, Agriculture, Domestic, Musical and Scientific, on this coast. Address
J. H. ATKINSON,
Northeast Corner California and Kearney streets,
10-6*] San Francisco, Cal.

AGENTS WANTED—$2,000 A YEAR AND expenses, to male or female; agents to introduce a new and useful invention, absolutely needed in every household. Agents preferring to work on commission can earn from $30 to $50 per day. For particulars, address W. G. WILSON, Cleveland, Ohio. 10 3]

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. [10 tf

Improved Wood-bundling Press.

In cities and large towns where the principal fuel used is coal, the work of preparing kindling wood for starting fires has become an important business. Frequently the wood, saw edinto convenient lengths and properly split, is delivered by a team, the fuel being packed in boxes or barrels. But the public requirements in the cities necessitate smaller and more portable packages. It is customary, therefore, to put the wood up in small bundles secured by a cord. To facilitate this bundling operation is the design of the machine herewith illustrated.



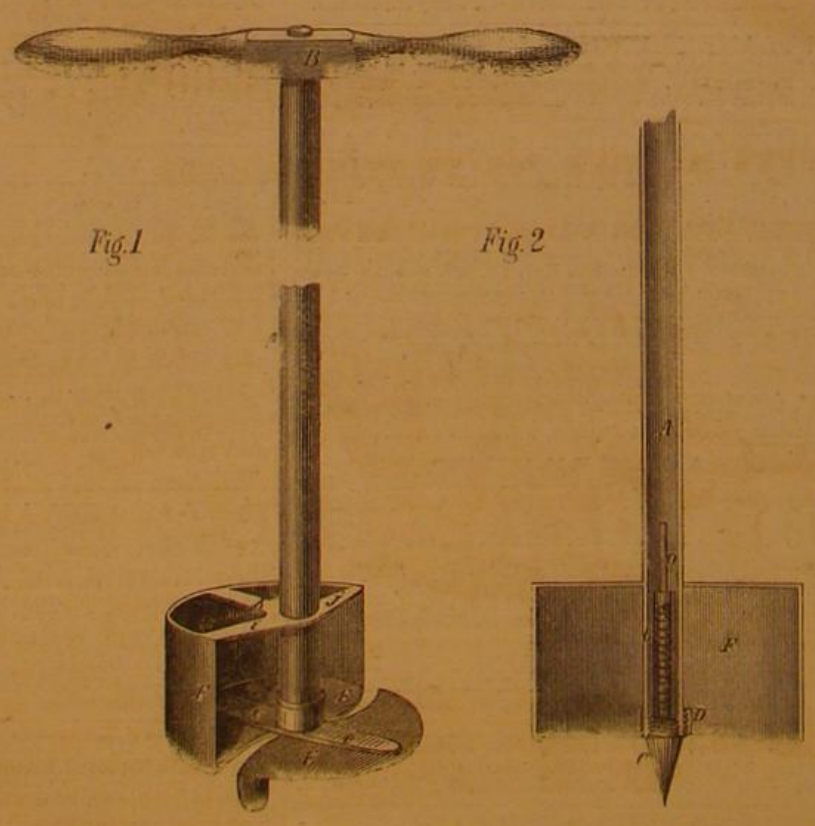
GREENE'S WOOD-BUNDLING PRESS.

It consists of a table having on its upper surface an iron box, A, cut through the sides, at the center, for the reception of the binding cord. A yoke, B, rises above the box and is attached, at either end, to a slide, C, which is moved up and down by means of double levers. The lower one is pivoted to the slide, and the upper one to the frame on the lower side of the table bed. The approaching ends of the levers engage a toggle, D, the shank of which attaches to the treadle, E. By raising the treadle, E, the yoke, B, is raised and secured in place, while the wood is being placed in the box, by the jointed foot, F, which allows the treadle to be raised, but keeps it from falling. When the wood is in the box, by turning the handle, G, the foot, F, is partly rotated, allowing the treadle to move down. A spiral spring brings the foot with its shaft back to place, and the foot can be elevated to any required point by means of a thumb screw.

This appears to be a convenient contrivance for the purpose intended. It was patented July 5, 1866, by Darwin A. Greene, and is manufactured by the Miles Manufacturing Co., 59 Lewis street, New York, whom address for additional particulars.

Patent Earth Borer.

The invention herewith illustrated appears to be one of those simple improvements which, when known, excites surprise that it had not been before discovered. A glance at its advantages is sufficient to demonstrate its efficiency.



CARY'S IMPROVED EARTH BORER.

The engraving represents a perspective and a sectional view of a simple apparatus now in use, for boring holes for fence posts, wells, driving pipe for oil wells, telegraph poles, etc. It is equally efficient on a large scale as when operated by hand for post holes. By reference to the engraving, the description will be readily understood. The shank, A, is of wrought-iron pipe, for a reason which will be presently explained. It may be made of any length desired, by adding sections as the work progresses, or it may be fitted with a handle, B, for ordinary purposes. To the bottom of the shank a cross arm, *e*, is secured, to which the blades, E, are fastened. F is a semicircular scoop for removing the earth or water, and for sustaining the apparatus in an upright position in boring deep holes. It is secured to the shaft, A, by the radial arms, *h i j*. C is the point of a valve, the stem of which, *o*, extends up through the pipe, *b*, which screws into the lower end of A. This valve is held up against its seat, at the lower end of A, by a spiral spring. The object of this attachment is to destroy the vacuum formed under the borer when it is raised, or, rather, to counteract the downward pressure of the external atmosphere; for the borer with its load of earth fits the hole as a piston fits a cylinder. But upon raising the borer the air rushes down the tube, A, overcomes the resistance of the spiral spring, and allows the apparatus to be lifted. Patented July 31, 1866, by Samuel Cary, of Centerville, Parish of St. Mary's, La., whom address for further particulars.

What is a Metal?

Notwithstanding the boasted exactness of definition which we are accustomed to ascribe to scientific nomenclature, the branch of chemistry is unable to furnish a concise definition, of universal acceptance, by which we can with certainty determine the right of any substance to be ranked as a metal. Authorities differ in their acceptance of what shall, and what shall not, be included under this broad class. The old proverb recurs with redoubled force, "Who shall decide when doctors disagree?"

In this connection, in a late article, the *Mechanics' Magazine* makes the following pertinent remarks:

"We have no general definition of a metal to show us what constitutes any substance metallic or non-metallic. This is very odd, as metals are considered to form such a distinct class from other substances. Besides, chemistry is held to be such a marvelously exact science. Still, the most learned in chemistry are not agreed as to what substances are metals. Some say 'silicium,' which is its name as a metal; others say 'silicon,' which is its name as a non-metallic substance. Then some take into the list of metals arsenic and tellurium, and others reject them. There apparently is no property yet discovered that is common to the whole list of fifty-two metals. Some even go so far as to consider that a metal may be a compound of two gases, nitrogen and hydrogen. In fact, it is altogether uncertain what constitutes a metal and what does not. The word metal, apparently, is just a name, without any distinctive and well ascertained properties attached to it or understood by it. It is hardly in agreement with the pretensions of our chemists that there should be such looseness and uncertainty about the application of a name, and a name of such importance, which represents such a common class of substances."

Securing Lumber on Wagons.

Long lumber is generally loaded on teams with the front ends of the boards much higher than the rear end. The load is secured by ropes, which is not a handy or always effectual means. A correspondent, Y. B., sends us a simple device which is merely a network of strong cords, or small ropes, with two lines attached, one end of which, furnished with rings, is hooked under the wagon, and the other brought up and tied to stakes on the team. The net holds the ends of the lumber. When not in use it can be fastened under or carried in the wagon.

It is said that wool washed on the sheep shrinks thirty per cent in manufacturing.

MECHANICS

INVENTORS, MANUFACTURERS.

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other Manufacturing Interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc., Household, Horticultural, and Farm Implements—this latter Department being very full and of great value to Farmers and Gardeners, articles embracing every department of Popular Science, which every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent Law Decisions and Discussions, Practical Recipes, Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July,

Per annum.....$3 00
Six months.....1 50
Ten copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free. Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City.

Messrs. MUNN & CO. have had twenty years' experience in procuring Patents for New Inventions. Inventors who may have such business to transact can receive, free, all needful advice how to proceed.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

Scientific American.

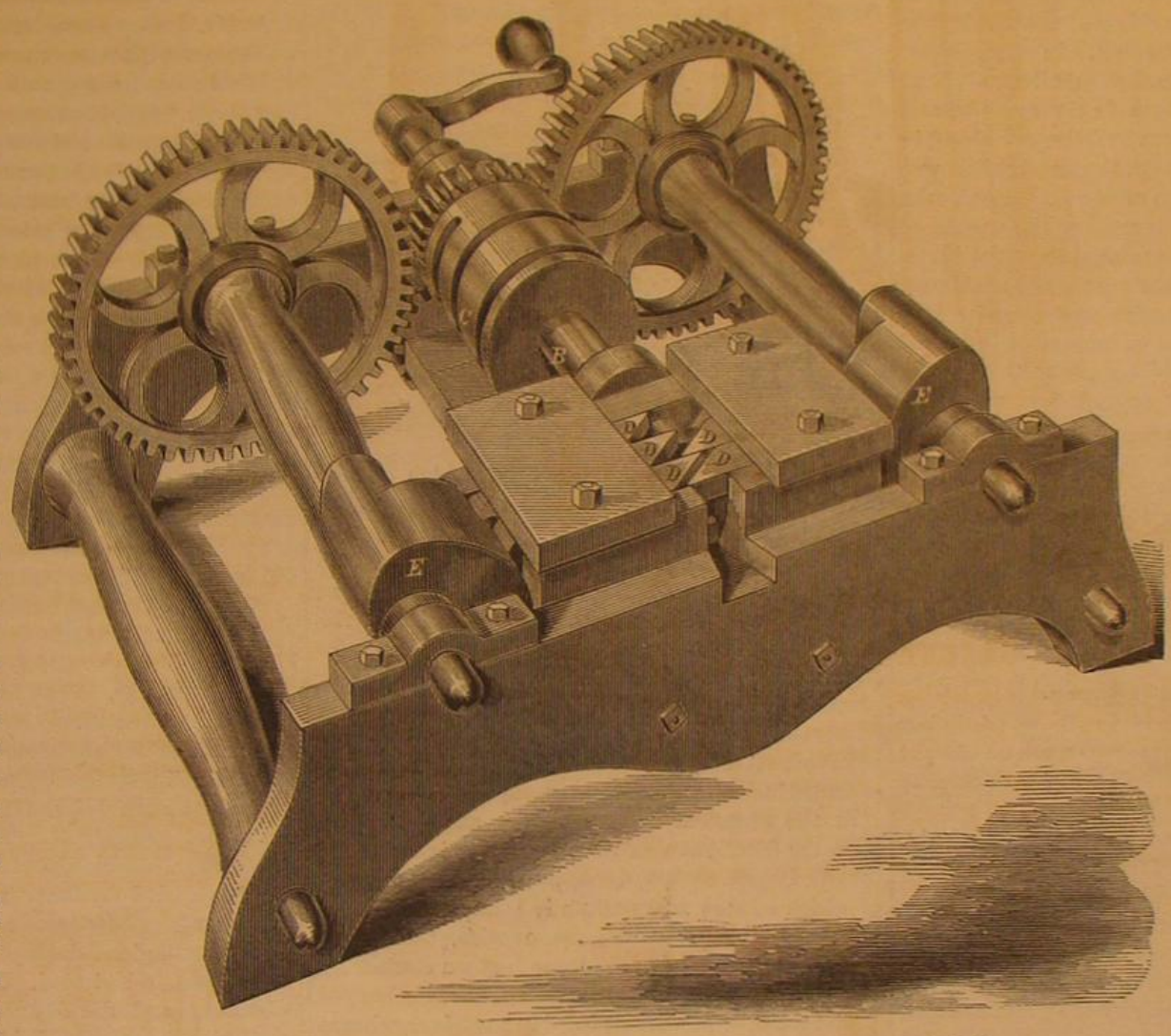
A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XV.—No. 13. [NEW SERIES.] NEW YORK, SEPTEMBER 22, 1866. $3 per Annum, [IN ADVANCE.]

Machine for Twisting Augers.

The manufacture of augers, like some other articles of common use, seems to have escaped the grasp of inventors until the present time; prolific as they have been in supplying every imaginable want in many other things, and even in making articles for which a demand has to be created. The want of a good practical machine for twisting augers, has long been felt in the trade, and several attempts have been made to supply it, from time to time, although hitherto more ingenuity than practicability has been shown by those who have had the matter in hand. More success has attended the efforts to improve the form of the auger itself.

The improvement is very marked between the old shell or pod auger—which has to be drawn and greased every few inches while in use, and required all the strength of the workman to force it into its work—and the modern ship auger, turning out the chips with an ease and rapidity little dreamed of by our forefathers. The blank, A, Fig 3, is forged by hand or swedged in a "drop," and has a longitudinal rib, or feather, running along its center, to insure the requisite stiffness and strength. The point end of the auger is inserted in a transverse slot—not shown—in the shaft, B, to the depth of the flat portion which is to be twisted, the shank end being held by a pair of tongs.



GRIER & BOYD'S MACHINE FOR TWISTING AUGERS.

The shaft, B, is provided with a cylinder, C, having a screw, or spiral groove, cut upon its surface, with a gaining twist. A pin secured to the frame under the cam works in the grooves, serving as a nut. The shaft, being rotated by the crank or a pulley, is drawn back as it turns by means of the screw cam. When half a turn is made the first of the jaws, D D, are forced together by means of the cams, E. The first pair of jaws seize the auger, and, being the exact negative of its twist, hold it firmly and prevent further twisting. The next pair come to their work on the next half turn, and so on until all the jaws have performed their office, when springs under the jaws force them simultaneously apart as the cams rotate past their centers. It will be seen, by reference to Fig. 2, that the faces of the jaws are dies, exactly corresponding to the twist of the auger. The complete operation, from the time the blank is entered until the auger is completed, occupies only ten seconds.

By trials with a wooden model, using blanks of cast lead, we are satisfied that the machine will do all that is claimed for it. Undoubtedly it may be somewhat modified, but the principle and execution are excellent. It certainly is a decided improvement on the present process.

The best points in this machine will soonest be perceived by the practical auger maker. From the manner in which the blank is fed out no undue strain can draw the edges. The lips are set quite true while being twisted further, so that on leaving the machine no "crimping" is required, and the surface is so smooth that it can be at once put on the emery wheel.

Fig. 2

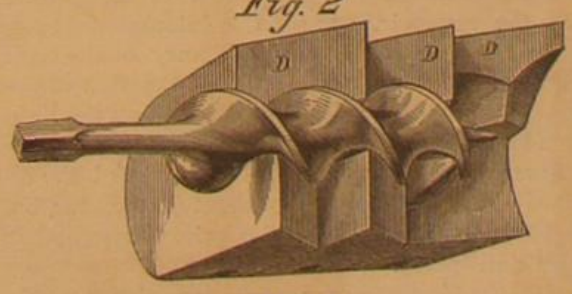
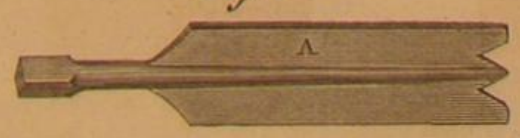


Fig. 3



Patented May 22, 1866, by Messrs. Grier & Boyd, Hulton, Alleghany Co., Pa.

Nitro-glycerin.

The Academy of Sciences has received a paper from M. Ropp on the application of this highly explosive substance to blasting the sandstone quarries of the Vosges. The catastrophes at Aspinwall and San Francisco having proved how dangerous it is to convey this substance from place to place, M. Ropp has his nitro-glycerin manufactured on the spot. For this purpose smoking nitric acid is mixed in a sandstone trough, standing in cold water, with double its weight of concentrated sulphuric acid, while at the same time a quantity of glycerin, exempt from either lime or lead, is evaporated in a caldron to the consistency of sirup, making from 30 deg. to 31 deg. of Beaumé's areometer. When this glycerin is perfectly cool, 500 gms. of it are slowly poured into a glass balloon immersed in cold water, and containing 3,300 gms. of the mixture of acids, which must also be cold. While this is doing the liquid must be well stirred. It is then left to stand for ten minutes, after which it is poured into about six times its bulk of cold water, which is made to turn round all the time. The nitro-glycerin is immediately precipitated in the shape of a heavy oil, which is separated by decantation, and then bottled. To use it for blasting, a hole is drilled into the rock, and 1,500 gms. to 2,000 gms. of nitro-glycerin are poured in. A cylinder made of tin or pasteboard, about one and a-half inches in diameter, and two inches in hight, and filled with gunpowder, is gently let into the hole, till the operator feels that it touches the liquid. A slow match is affixed to this cartridge, and the hole is filled up with white sand, the match is lighted, and in about ten minutes the gunpowder will catch fire, and give the nitro-glycerin the necessary shock to make it explode. The whole mass of rock is then seen to shake, waver, and then settle down again. No piece is projected to a distance, and it is only on examining the spot that it is possible to form an idea of the immense force developed. Formidable masses are found slightly displaced, and rent in every direction. In this way from 40 to 80 cubic meters of hard rock may be detached at a time. Nitro-glycerin, when long exposed to moderate cold, will crystallize in needles. In its liquid state it is a yellow or brownish oil, heavier than water, and insoluble in it. It does not easily catch fire, nor does it explode without a smart shock, except when by long keeping it gets decomposed. Its taste is sweet and aromatic; it is poisonous, and a very small quantity will cause violent headache.—*London Mining Journal.*

The "Bellerophon."

On Aug. 17, a series of trials of the fine iron-clad *Bellerophon* took place at Stokes Bay, when results were obtained which demonstrated in the most striking manner the soundness of the principle upon which the vessel had been designed. On the occasion in question the ship's draught was 21 feet 7 inches forward, and 26 feet 6 inches aft, her displacement being about 7,230 tuns, and she was fitted with a

Griffith's screw, 23 feet 6 inches in diameter, with a pitch of 20 feet. The wind was very strong at the time of the trials, but, notwithstanding this, the mean speed obtained during six runs over the measured mile, made with full boiler power, was 14·201 knots, the engines averaging 75 revolutions per minute, with a pressure of steam of from 27 to 28 lbs., and a vacuum of 25 inches. The indicated horse-power developed by the engines was 6,400 horses, or nearly 6½ times the nominal power, and the whole of the machinery which, as is well known, was constructed by Messrs. Penn, worked in the most free and perfect manner throughout. After the handiness of the vessel had been tested, and proved by turning circles, four runs were made with half-boiler power, the result being that a mean speed was obtained of 12·164 knots, the engines averaging 63 revolutions, while the pressure of steam varied from 22 to 26 lbs., and the vacuum from 25½ to 26 inches. The turning power of the vessel was then tested under half-boiler power, and the trials concluded with some experiments on the working of the engines to signal from the bridge telegraph. In these latter trials the engines were stopped from full speed ahead in 30 seconds, started astern in six seconds, and changed from full speed astern to full speed ahead in 19 seconds. As is well known, the *Bellerophon* was built according to the design of Mr. E. J. Reed, who has asserted that the great length of the vessels of the *Warrior* class was not essential to speed in an iron-clad frigate; but that the necessary speed could be obtained in combination with moderate size and cost, and with the additional advantage of increased handiness. The trials of which we have above given some particulars completely prove the soundness of these assertions, the *Bellerophon*, a vessel 300 feet in length, attaining a speed which was only 0·155 of a knot less than that of the famous *Warrior*, a vessel 380 feet long, while it exceeded that of the *Black Prince*, a vessel of the same dimensions as the *Warrior*, by more than half a knot. We congratulate Mr. Reed upon his success, which is a most gratifying one.—*Engineering*.

The Art of Dining.

The following sensible advice in the art of dining is from the pen of Prof. Blot, whose work on the art of cookery we have so often had occasion to refer to in these columns:—

"The mind has its diseases as well as the body, and I think vegetarianism is one of them. It is by practical experience that we learn what food is proper for us, and not by chemical analysis. Every thing we eat, with the exception of salt, can be turned into charcoal; yet who can live on charcoal? An experiment has been made by the great chemist, Magendie. He fed geese on gum only and they died on the 16th day; he fed some upon starch only, and they died the 24th day; he fed others on boiled white of eggs, and they died on the 46th day; he fed others on the three kinds mixed together and they fattened instead of dying. So we must vary our food as much as possible in order to supply the waste of every part of our system. In cooking vegetables, green vegetables, such as cabbage, spinach, etc., should be put into water at its first boiling, with salt. Dry vegetables, like beans, peas, etc., should be put over the fire in cold, soft water, after having been soaked in luke-warm water—beans for twenty-four hours. Potatoes should be steamed but never boiled Steam with the skin on. Bear in mind that a potato must never be pealed; the part immediately under the skin contains the most nutriment. Cut out the eyes or germs if any; if young and tender, the skin can be taken off with a scrubbing brush; if old, scrape the skin off and then roast them. In selecting the potato, remember the smaller the eye the better the potato. By cutting a piece from the thickest end, you can tell whether they are sound. They must be either white or pink, according to the kind. Always select beans without spots. Milk and eggs partake of the nature of animal as well as vegetable food. Fish is less nutricious than meat, containing only 20 per cent of nutricious matter, but ought to be partook of at least twice a week. It contains more phosphorous matter than any other food, and is very good to supply the waste of our system, especially of the brain. The brain of an idiot contains about one per cent of phosphoric matter, while that of persons of sound intellect contains from two to two and a half per cent. The brain of a maniac contains three and a half per cent. We need not fear, however, of losing our senses from eating too much fish. It supplies the waste, but does not augment the proportion of the phosphoric matter."

The chemistry of the matter might, perhaps, be stated with more precision. For instance, instead of saying that everything we eat may be turned into charcoal, it would be more accurate to say that carbon, being the one solid of the four organic elements, the others may be driven off by heat, leaving the carbon behind in the form of charcoal.

Items from the British Association.

At the recent meeting of the British Association at Nottingham, a paper was read in the mathematical section, by A. Claudet, F. R. S., on a subject which will prove of great importance to all interested in photography, "on a new process for equalizing the definition of all the planes of a solid figure represented in a photographic picture." The impossibility of procuring a well-defined image of all the various parts situated on different planes, has always been a serious disadvantage in taking large pictures. If the instrument is focussed for one plane of the face, such as the cheek, minute granulations of the surface are sharply defined, while another plane, as the nose or ear, is so far from the focus as to have an indeterminate outline. M. Claudet sought to obviate this evil by changing the focus while the plate is being exposed. To effect this the lens tube was arranged with rack and pinion, so that the back lens might be moved during exposure over a distance not exceeding one-twentieth of an inch, by which operation a succession of images of each plane is portrayed.

After reading the above article, which elicited much applause, M. Claudet exhibited and explained a variable diaphragm of great ingenuity and simplicity, which he designed for use in telescopes and photographic lenses. The diaphragm is simply an india-rubber cylinder composed of a series of ribbons or strips placed longitudinally. When now the cylinder is twisted round by one end—the other remaining stationary—it will acquire a sand-glass form, the center gradually closing to any diameter required. A diaphragm having this property was patented in the United States some years ago.

In the chemical section of the association, we have the description of a "new magnesium light," invented by H. Larkin, the distinguishing peculiarity of which is, that magnesium is burned in the form of powder instead of ribbons or wire, and consequently the action is not dependent on clock-work or other motive power.

The metallic powder is placed in a receiver, whence it escapes through an orifice into a brass tube, which has also a stream of common illuminating gas introduced at its upper end. The united gas and metal flow together down the tube and are ignited at its mouth, producing a light of great intensity. In order to insure the steady flow of the powder from the reservoir, fine sand is introduced in any quantity depending on the brilliancy of the light required. A valve also regulates the flow of the powder, or entirely shuts it off, leaving the light from the illuminating gas alone.

In answer to inquiries, Mr. Larkin stated the expense of the light would be about $5 per hour, but that further reductions in the price of magnesium were anticipated.

Improvements in the Construction of Artesian Wells.

The sinking of artesian wells cannot be claimed as an invention. This method of obtaining a copious supply of water dates back many hundreds of years, and is even claimed by the Chinese to have been introduced by them centuries before the Christian era.

Improved machinery has greatly facilitated the boring of artesian wells in this country, and the latest improvements are now being used in the sinking of the artesian well at Detroit, Mich.

Instead of the old samson post and walking-beam, the new boring apparatus works upon the independent drop principle, and can be let down and changed instantly from three inches to as many feet. This is done by means of a new frictionless cam working upon leathers attached to the drop-chain. The auger which is used to bore down as far as the rock is a semi-cylindrical tube of iron two and a-half feet in length, ten inches in diameter, pointed with steel, and bottomed to hold the clay. It is worked by a windlass, instead of the original temper screw, which was slow and tedious. The auger stem is two and a-half inches diameter, best wrought iron, constructed in sections of sixty feet.

The machinery appliances are of such perfection that instead of the ten to sixteen horse-power required at the common machine, three or four will suffice. The well will be lined with the strongest boiler iron in sections of twenty-five feet in length. The largest of these will be eight inches inside diameter, and as the well is sunk, smaller sections will be slid down through and joined, so that from the top to the bottom it will be a single case of solid iron.

Armor-plate Fastenings.

As Mr. Holley remarks in his work on ordnance and armor with respect to armor plates:—"After all it is not so much a question of plates as of bolts" (par. 192); "and, if one plate is thrown off, the ship is at the mercy of 15-inch shells." The Admiralty are, very properly, just now doing their utmost to determine upon the best fastenings for armor plates. Upon an admirable principle, in the abstract, is Major Palliser's plan, which simply consists in turning down the shank of the through bolt to the smallest diameter of the screw thread. This principle has been adopted in many cases from time immemorial by engineers. A neat adaptation of it is given in Mr. D. K. Clark's "Recent Practice on the Locomotive Engine," who (p. 17) recommended, long before Palliser's patent, the thinning down in the middle of firebox stay bolts, in imitation of a similar arrangement adopted several years previous in America. This in itself would not diminish Major Palliser's merit, nor invalidate his patent, for the application of this perfectly sound and very ingenious idea to armor-plate bolts. But, no doubt unknown to Major Palliser, Messrs. Brown & Co., of the Atlas Works, as has been stated to us on unimpeachable authority, made their armor-plate bolts on this plan before the date of the gallant officer's patent; and they found themselves obliged to reject it because such bolts, thinned out in the middle, could not properly fill up the hole in the backing. We believe, however, that Major Palliser increases the size of his bolts for re-insertion by coating them with an alloy of lead and antimony. Whether this addition will give fair play to the principle, remains, we suppose, to be tested. It is very proper that the Admiralty and the War office should fairly test meritorious plans of this kind; and the inexorable logic of 68-pounders soon sifts, as it has so often done before at Shoeburyness, the wheat from the chaff.—*Engineer*.

Austrian Manufactures Injured by the War.

We regret to announce, says the *Memorial Diplomatique*, that the participation of Austria in the Universal Exhibition to be held at Paris next year has become very doubtful. The most busy manufacturing provinces of the empire are Bohemia and Moravia, which have been literally ravaged by the Prussian occupation. A large number of objects intended for the Exhibition at Paris have been carried off by the Prussians; and again, the exactions and the contributions of all kinds that were levied have been such as to place it beyond the power of the manufacturers to make those fresh sacrifices which would be required to maintain their credit in the general competition of 1867. Rather than present themselves in a position of lamentable inferiority, the Austrian manufacturers prefer to abstain from appearing at the Paris Exhibition, and to reserve their powers for the great Exhibition which is projected to be held in Vienna in 1870.

THE office of the "Nautical Almanac" is to be removed from Cambridge to Washington. The superintendence of the Almanac has been placed in the charge of Professor J. H. C. Coffin.

A PIANOFORTE has been constructed in Paris, having the strings replaced by tuning forks. The new instrument has great power and sweetness.

[For the Scientific American.]

INTERESTING ACOUSTIC PHENOMENON.

CAUSE OF THE JINGLE OF CERTAIN NOTES ON THE PIANOFORTE AND OTHER MUSICAL INSTRUMENTS.—Many persons have been annoyed by the unpleasant jingling sound of certain notes on a pianoforte, and without the remotest conjecture as to the real cause, have searched the instrument through for some screw loose or some substance supposed to have accidentally fallen in among the works. They have undoubtedly noticed that it was not always the same note that jingled, and that sometimes unaccountably the jingle would cease for a while and then suddenly be renewed, and also that changing the position of the instrument in the room would stop the jingle or transfer it to another note. About two years since I consulted Mr. Wilde, a pianoforte maker and tuner, of this city, about certain defective notes on my piano, one of which it seemed almost impossible to tune correctly. Mr. Wilde informed me that he had frequently noticed, even on the best pianos, that therewas very frequently one such note which it was impossible to bring to a good unison (that is of its two strings), and, moreover, he said that it was not the fault of the piano but something in the room that interfered, and that the jingling of certain notes was not in the piano but outside of it. He had lately had a new and first-rate instrument condemned because of the intolerable jingle of two of its notes, and requested me to go with him to see this piano and verify his theory. We accordingly visited the house where the pianoforte had just been set up, and found the complaint justified by the fact that two of the strings had a very loud jingle. The room was very small, and while I continued to strike one of these notes, Mr. W. went about the room touching everything with his finger, and at last he touched a pane of glass in the window near the piano and the jingling ceased at once. On removing his finger it recommenced. On applying the finger nail very delicately to the pane it was found to vibrate, and on approaching the ear it was heard distinctly to give out the precise sound of the note on the piano. The solution of the jingle was now clear. The pane of glass was loose and its key note was in exact unison with the much-abused note of the piano, and whenever this note was struck the glass was sounded according to the sympathetic law of acoustic vibrations, and the real jingle was from the pane of glass and not from the string. On wedging the pane so as to prevent its vibration, the note on the piano was as smooth as could be desired. Search was then made for the confederate of the other jingling note, and this, too, was found to proceed from another loose pane of glass in another window. This being wedged up the piano was found to be in excellent order. The theory of Mr. Wilde as to the sympathetic vibrations being thus fully verified, not the least curious feature of the phenomenon remains to be explained. How does it happen that the jingle all seems to come from the piano and is not referred by the ear at once to its true source? This depends upon that remarkable defect of the ear, viz., its inability to judge of the direction and origin of sounds, especially when all the attendant circumstances are favorable to an illusion. It is the identical principle upon which the ventriloquist depends for the success of his art. The string is struck, gives out its sound, and before it ceases, the sympathizing pane of glass or other body commences to sound and continues its sound after the original note has ceased. This prolonged sound is not located by the ear any further than to identify it with its actual origin, the piano, and hence the illusion. The eye, the ear, the fingers, all bear testimony to a note from the piano, the judgment is so informed, and the ear, unassisted by either of these witnesses, is incapable of truly locating the sympathetic sound, or, at least, is the unsuspecting dupe of the other senses, and the two notes belag blended are referred to one origin. There are some very curious freaks observed about these sounds. Sometimes the motion of the piano alone will stop them or transfer them to other notes. It is probable that absolute unison is necessary to produce the sympathetic sounds to any notable degree, and that the motion of the instrument upon the floor produces a change of tension, either on or in something without the instrument so as to effect the result. A most remarkable instance of this jingle lately came under my observation here. A new piano at a friend's house was found to have a jingling note, and the whole parlor was searched for the cause. At last it was found in a mantel clock. The striking part of the clock had run down and upon winding it up the jingle ceased. Anything loose about an instrument will annoy by its rattling, but it will be found generally that the jingling of certain notes can be traced to sympathetic vibrations and be readily cured.

CHAS. G. PAGE.

Washington, D. C., Sept., 1866.

Reproduction of Drawings, Etc.

A process has recently been patented in England for the direct reproduction of drawings, tracings, or engravings, whereby a *fac-simile* copy is procured, the light and shade of the original being copied as such, and not reversed as in the ordinary method. The paper designed to receive the copy is floated upon a solution consisting of thirty grains bichromate of ammonia dissolved in one ounce of water; to this is added an amount of dilute phosphoric acid, to be determined by trial, generally about two drams. The paper thus prepared is dried in the dark, and may be kept any length of time. When used, it is placed in the ordinary printing frame and exposed from two to thirty minutes, depending on the light. When removed from the frame, the paper, in contact with the drawing, is laid on the bottom of a box and exposed to the vapor from a dilute solution of aniline in benzole, which blackens all the parts not previously acted upon by the light; washed in pure water, rewashed in dilute sulphuric acid, and again in water; after which the print is fixed with a solution of thirty grains phosphate of copper in one ounce of water; to this add sulphuric acid till a clear liquid is obtained, and fifteen drams of a saturated solution of chromic acid.

An Invention Wanted.

An eminent reporter for the press, etc., says:—"Will you allow me to inquire through your paper whether it is not possible to prepare thin tissue paper chemically in such a manner that by moistening it and using a hand press, it will take the impression, and produce a copy of any written dccument, no matter how long the ink may have been dry on the original paper. By what means should this copying paper be prepared?

"To members of my own profession who are frequently required to make hurried copies of official documents, the need of such an invention is apparent. I know of no 'sensitive' paper of the kind desired, nor have I sufficient knowledge of chemistry to know whether it could be made, and therefore take the liberty of troubling you for information. It would be necessary, of course, that the chemical ingredient used should not injure the texture or materially impair the color of the document which is to be copied."

We leave it to our ingenious friends to solve this problem and produce the required copying paper.

The Iron and Copper Resources of Great Britain.

The products of the British iron mines in 1865, were 9,910,045 tuns, valued at the place of production at $16,644,025. This was used to feed 656 blast furnaces, and was converted into 4,819,254 tuns of pig iron. Of this 543,018 tuns were exported, and the remainder occupied 6,407 puddling furnaces; and 730 rolling mills were employed in converting it into finished iron. The production of copper has been for some time declining, both in quantity and quality. Last year 82,562 tuns of ore was imported, in addition to vast quantities in cakes, and manufactured.

Patent Hair Restoratives.

The manufacture and sale of hair restoratives has always been a favorite with a certain class of public benefactors, whose disinterested labors have resulted in the foundation of many a fortune. We lately came across the specifications of an old English patent which will, perhaps, be interesting at a time like the present, when alcohol and bear's grease command such fabulous prices.

This patent was for "an apparatus for improving and restoring the human hair," introducing a new feature in this line. By the plan of this inventor combs and brushes are to be constructed of different metals, so that when in use electric currents are given off; "thereby the skin is caused to be stimulated and a healthy action ensues, restoring the hair to its original color, and generally improving its appearance." The same effect may be produced by having the articles formed partly of metal having batteries connected therewith when in use. As the patent claim long since expired, the above method is open to any enterprising individual wishing to experiment.

MISCELLANEOUS SUMMARY.

THE work on the Central Pacific Railroad, in California, is rapidly progressing. It is expected that next month it will be completed from Sacramento to Cisco, ninety-three miles. The work of railroad building in this lofty and rugged region, ascending from 3,600 to nearly 6,000 feet above the sea, is very heavy—a succession of deep cuts and huge fills; but the host of Celestial laborers, under the energetic control of Saxon and Celt, is so numerous that the mountainous obstacles are "here to-day and gone to-morrow."

THERE are 1,000 telegraphic offices in Europe. Africa is connected with the Continent by two lines. Egypt and India have each two routes. The latter contains 161 stations; the island of Ceylon has four more. Dispatches for China pass through Russia, thence to the frontier towns of Tartary, where, received by horsemen, they are delivered through the Empire, reaching Pekin.

FIFTY thousand pounds of powder in a cartridge and rocket factory at Constantinople, exploded on the 19th of July, killing 72 persons and wounding 24. Fragments of the killed were picked up more than a half mile distant, and not the smallest piece of the building remained to show where it had stood.

A CONVENIENT and economical mode of draining and drying sensitized photographic paper, is by placing the sheets between clean white blotting paper to remove the superfluous solution, instead of hanging up the paper to dry.

THE *Engineer* reports that Mr. Jos. Snider, the inventor of the system of converting Enfields adopted by the Government, is suffering from paralysis of the brain, said to have been greatly accelerated by the worries and anxieties caused by his uncertain and harrassing relations with Government boards.

THE Montreal *Gazette* states, on the authority of an experienced marksman, who has repeatedly practiced with breech-loaders, that the grease is liable to clog the metallic cartridge in cold mornings, and seriously affects the efficiency of the weapon, making it comparatively useless.

THE Imperial Commissioners of the Paris Exhibition have made special arrangements for an exhibition of the weights and measures of all nations, a conference will also be held with a view of establishing one system throughout the world.

IN excavations now being carried on in Paris, four mines are fired simultaneously by an electric battery; a surface of over two acres is thrown up at each explosion.

A MAN in Buffalo claims to have discovered that sheet iron will serve for belting in place of leather or rubber. We have not much confidence in the utility of this improvement.

A BRICK YARD is to be established in Chicago having facilities for making 200,000 bricks a day. The work will commence immediately, and when finished it will be the largest in the world.

PRUSSIA gains by the last treaty 42,584 square miles of territory, with an additional population of 7,171,680.

AN exchange says that fresh meat can be kept good and sweet for several days by immersing it in buttermilk.

ONE steam vessel may be considered to perform the work or four sailing craft, each of the same tunnage.

THE city of Antwerp has been devastated by a petroleum fire to the amount of £250,000.

AT the North pole, either direction is south

ENGLISH RAILWAY CARRIAGE SIGNALS.

Ever since the murder of Mr. Briggs, by Muller, on an English railway, the English have been racking their brains to invent some means by which the occupants of a car, or of a compartment in a car, can communicate with the "guard," or the engineer. The cars, or carriages, on English railroads are divided into compartments, calculated each for the accommodation of six or eight persons, and when once in, the passengers are held under lock and key, there being no communication between the different carriages of a train, nor between the different compartments of the same carriage. Under these circumstances robbery and even murder are feasible, as has been proved in many other instances beside that of Mr. Briggs.

Evidently, if communication, instant and certain, with the engineer or conductor, is of value on any road, it should be on roads managed in this manner. The English style of railway carriages has its advantages over that of our roads, where all, without regard to character, age, nationality, or disposition are indiscriminately herded together; but it is as evident that it has also its disadvantages and dangers. We secure immediate connection with the driver of the train by a simple cord passing through loops on the ceiling of the cars, and connected between two carriages by a snap catch. By this cord the whole train is connected, the passengers in the rear car having equal facilities, with those of the forward car of communicating with the engineer. A pull of this cord will ring a bell in the engine cab, and the engineer instantly sounds "down brakes" and reverses his engines.

But this is not the English style; the following is from the London *Athenæum* :—

Each compartment is fitted with a "lever box," each box bearing an engraved tablet of instructions in the following terms: "To communicate with the guard for stopping the train, pull the lever."

The effect of a passenger pulling the lever is to set a bell ringing in each of the guard's vans, and these bells, when once so started, will continue to ring until stopped by the guard. The guard of the rear van (who is the guard in charge of the train) then depresses a key, which rings a bell on the engine. The attention of the engine-driver being thus aroused, he consults a galvanometer which is attached to the bell, and upon that he finds exhibited, in a simple and unmistakable manner, the signal "Stop instantly," or, "Stop at next signal station." The driver acknowledges by his engine whistle.

The rear guard uses his discretion as to whether the train shall be stopped instantly or at the next signal station. Of course, if he sees any danger to the train he will give the first-named signal. When a lever has been pulled, it can only be replaced by the guard, who has to unlock the box containing the apparatus, and reset the lever; repudiation by a passenger of having given the signal is therefore effectually checked.

We are not informed how long a time elapses between the act of pulling the lever and the stopping of the train. The "rear guard," who can know nothing of the cause of the alarm, "uses his discretion" as to when and where the train shall be stopped, and acts accordingly. But we are relieved by the statement that "of course, if he sees any danger to the train he will give the first-named signal," *i. e.*, to "stop instantly." Imagine, for a moment, the "guard in the rear van," or carriage, seeing danger ahead, or being cognizant of a murder or robbery in one of the forward cars, or a forward compartment of the "rear van." Certainly, the inventor of this lucid and useful improvement should be knighted at once. Electricity with "levers," "engraved tablets," "keys," and "unmistakable signals" to stop a train!

This stupendous invention is the result of years of study and endeavor by the inventors of Great Britain. A cord passing through a train and through each compartment of a car, is not exclusive enough, or too Yankeefied for English approbation. If they keep at it, possibly before a new generation comes upon the stage they will succeed in improving upon the Yankee style.

The Breaking of Watch Springs.

In reply to the inquiry of a correspondent, published in No. 11, present volume, we have received two communications. One writer says he has made careful examinations of several springs immediately after breaking, and found that they were corroded at the point of fracture, principally on the edges, caused, he believes, by the perspiration of the hand in repairing them. The corrosion acting slowly, the spring seldom broke till some time after the watch had been repaired.

Another attributes the breaking to oiling the spring, as a mainspring will break just as soon by oiling it without cleaning it or removing it from the drum, as it would if uncoiled and again recoiled. The oil, he thinks, unequally penetrates the spring, weakening the enamel, and advises that the spring be oiled sufficiently, when the watch is first made.

MYER'S STOPPER AND DISCHARGE SPOUT.

Much annoyance and dirt are occasioned by the adherence of some liquids to the outside of the vessel from which they are poured, and difficulty is often experienced in measuring, by drops, a portion of medicine from the apothecary's common tincture

Fig. 1.

vial. The object of the improvement illustrated in the engravings is to remove these annoyances and difficulties. It consists of a discharge spout, with or without a cap, which can be applied to any suitable vessel, as bottles, vials, sirup pitchers, jugs, dippers, gravy dishes, oil cans, etc.

Fig. 2

The discharge tube, A, may be made of glass, or metal, either surrounded with cork, or fitted snugly to the mouth of the vessel, or it may be a fixed and permanent portion of the vessel, as in the graduating glass, Fig. 2. For vials, bottles, and sirup pitchers, a cap, B, is provided, made of glass, or metal, which fits snugly over the cork exterior of the spout, or is ground air-tight on the discharge tube. The principal feature of this improvement is an inclined channel surrounding the spout, which receives the waste and returns it to the vessel, without allowing it to flow down the outside. It appears to be a very neat and handy device, capable of extended application.

Patented through the Scientific American Patent Agency, April 3, 1866, by Dr. L. B. Myers of El-

Fig. 3

more, Ohio, whom address for additional particulars.

TRACTION ENGINES AND ROADS.

A correspondent sends us a description of a traction engine built in Paterson, N. J., with an account of its trial performances. As he neglects to append his signature to the article, we have no means of judging of the reliability of his statements, and decline to express an opinion on the merits of the machine. Undoubtedly the builders, if ultimately successful, will make all the facts concerning the machine public.

We think traction engines can be built to be used economically in this country. They find little difficulty in working them in England. Our common roads, however, should be made better and more permanent than is the custom now, before they can be introduced to become generally useful. This subject of roads is one that should receive much more attention than has heretofore been bestowed upon it. Not every ordinary laborer is capable of laying out a road. It is a work important enough to be confided to eminent engineers, and engineering talent should be employed in its construction. A road is not intended for a temporary structure. It is for us, our children, and our children's children, and when once located, by the best and most feasible route, should be built and maintained in the best of order. A permanent roadway, although more costly at first than some of the wretched apologies for roads which are to be found all over the country, is much cheaper as requiring fewer repairs, which often absorb in a few years as much as the total first cost. To be sure there are specimens of good roads in this country. Not to speak of park drives and private ways, there is a length of four miles between Providence and Pawtucket, R. I., which is as fine a road as can be found in the country, and which is always kept in good repair.

When our roads are properly constructed, built for permanency, rather than for present necessity and convenience, we may expect to see traction engines a practical success, and not before.

On Coloring Photographic Slides for the Magic Lantern.

The following excellent and practical instructions for coloring photographic and other transparencies for the lantern are extracted from a manual on the Magic Lantern, published in London.

APPARATUS.—The easel, an assortment of brushes and dabbers, an ivory and a steel pallet knife, a small muller and slab, a pallet, a penknife, an etching point, lithographic pens for outlines, pieces of linen or cotton rag.

MEDIA.—Oil of spike, lavender, turpentine, varnish, oxgall, Canada balsam.

COLORS.—Italian pink for yellow, Prussian blue, Antwerp blue, crimson lake, crimson.

These are the three primary colors, which are capable of yielding nearly all the rest by judicious mixture. The colors purchased should be those pre-

pared for oil painting, in collapsible tubes, and the purpose for which they are intended should be explained to the color maker.

The use of the muller and marble slab in well rubbing these colors down will be learned. For black, ivory or lamp black is used; for white the glass is left uncolored; for green, Prussian blue and Italian pink; for purple, lake and Prussian blue; for orange, lake and gamboge; for brown, either burnt sienna or a mixture of Prussian blue, lake, and Italian pink.

GLASS.—Patent plate and flatted crown are the two kinds obtainable. The former is expensive and only necessary to be used when something of an exceptionally superior character is to be produced. The latter will answer most purposes if the following precaution be observed:—The two sides differ from each other, one being smooth and the other having gritty particles, which may be distinguished on drawing the nail across. The painting should be done on the smooth side, or if the photograph be prepared with a view to subsequent coloring, it should be taken on the smooth side.

A good medium for mixing the colors is transparent oil varnish to which a few drops of liquor ammonia have been been added.

In the case of a photograph, no preliminary outlining is required, but where it is intended to reproduce a large engraving on a three-inch disk, a reduced outline of the required size is first made upon paper, and this being laid under the glass, the outline is traced through with the appropriate material. This outline is then protected by a coat of varnish, the coloring then begins, the sky first and then the extreme distance, and successively the middle distance, and the foreground, increasing in intensity of color and decision of outline as the objects approach the spectator. The required depth of color will regulate the amount of varnish to be used, and small dabs should be made on a piece of glass before beginning to paint, in order to ascertain the quality, transparency, and depth of colors. The remedy for excessive opacity is more varnish and ammonia. Two or three drops may be added to a teaspoonful of varnish.

The lithographic pen is to be used for tracing the outline.

Dabbers are made by burning down thick camel's-hair brushes to a round, stumpy end.

Another and very satisfactory method of coloring consists in using aniline colors, known as Judson's dyes; or better still, those prepared by Dr. Jacobsen for coloring photographs. In using these colors the disagreeable smell of oil and varnishes is avoided, the only medium required being water.

Before using the colors, it is imperatively necessary that the glass on which the design is either sketched or photographed should be coated with albumen. When dry it is ready to receive the colors, the albumen acting as a mordant; a plain piece of glass should also be coated with albumen, on which to try the depth of colors; and great care must be taken to keep the coloring within the outlines, as, being dyes, these colors cannot be removed.

To prepare the albumen, take the white of an egg, and add to it one ounce and a-half of water, beat all to a froth, and the liquid subsiding is fit for use.

FIRE LIGHTING IN OLDEN TIMES.

The refrain of an old ditty, the text of which we cannot recall, had a bit of advice which would not be appreciated now-a-days, it was—

Fire upon the mountains,
Run, boys run.

Why and in what direction should they run? Evidently to the mountains, not, as Lot did, to escape fire, but to get it. Why? Because fire was precious and scarce; as precious as that which fabled Prometheus stole from heaven, and more precious than diamonds, which light but do not heat.

How many who read this issue of the SCIENTIFIC AMERICAN, in this year of our Lord, 1866, can remember when the preservation of the hearth fire was a duty as exacting and necessary as that of the virgins in the times of Roman greatness, who were intrusted with the care of the altars raised to Vesta? Possibly many, but not all.

We confess to no "vigorous old age," yet we well remember when the last care of the housewife, after securing the door and trying every window, which duty she repeated three hundred and sixty-five times every year, was to carefully rake together the "live" coals, place the brands against the back-log, and cover all with the ashes. How she carried her tinder box, steel, and flint into her room, always sure there was enough of "punk" or charred linen rags, called "tinder," to enable her to strike a light at call. How on a cold morning when—

"The roads were dumb with snow,"

we have gone with shovel to the nearest neighbor, or further, for a portion of the precious element, which the gods deemed necessary for man in order to enable him to rise to their high estate. All this we remember.

In every house was a tin box, a round tin cup, rising some inch-and-a-half at the sides, in which was a quantity of "tinder." On that was a plain disk as a cover, and over all a lid which had on its upper surface a socket for a candle. A flint—a common gun flint, much more common then than now—and an old file. This was the fire-raising apparatus. The flint in the right hand, the steel in the left, its point raised above and pointing to the "tinder," a few strokes of the flint against the steel and a faint spark is evoked from the tinder. To make that spark a generating blaze, a slip of dry pine wood, its end dipped in melted brimstone, sufficed. These splinters of sulphur-tipped shavings were the originators of the present lucifer match, and in our boyhood days we have spent many an hour in shaving them from the block, a labor which, as a pastime, would have been pleasant, but as a task was irksome.

After a while came the phosphorus matches, which, when dipped in a vial, ignited on exposure to the atmosphere. These were costly and never came into general use, being shown as curiosities rather than employed as conveniences. Then came the present match, variously named as "loco-foco," "lucifer," and "friction" matches. The process of this manufacture has already been detailed in our columns. When these friction matches first came into use they were subjected to great opposition from the press, on the score of the facilities they afforded incendiaries in prosecuting their nefarious work; and for many years hundreds refused to use them. But their undoubted convenience and utility triumphed over all prejudices, and the friction match is now considered a necessity. There is no single article more extensively used, there being manufactured in this country alone one hundred millions daily.

PRINTING OF WOVEN FABRICS.

Popular apprehension usually confines the application of the "art preservative" to the multiplication of books, newspapers, or other periodicals, and the permanence of ideas which, spoken only, would be evanescent and die with their originator or his cotemporaries. But, although the preservation of ideas belongs mainly to that adaptation of printing which gives to writing its lease of life, by indefinite multiplication of copies, an idea may be as surely protected, if it appeals to the fancy and innate love of beauty, as though it confined its appeal to the intellect exclusively.

Printing is truly the "art of arts." It reproduces indefinitely the theories, ideas, and practical facts of thinkers and workers, and it as well subserves the purposes of him whose object is to appeal to the fancies and tastes of all classes. The production of figures on cloths is as really printing as the preservation of ideas by means of the letter type. The decoration of plain cloths with figures is one of the oldest of arts. It was practiced by the ancients, and the Chinese and Aztecs were in possession of the art when they became first known to Europeans. To this day the Chinese use the same method in printing cloths that they do in printing books. In the latter case we have improved upon their process in using movable types, instead of engraving on and printing from the blocks—we using in our stereotype process the movable types to produce the block, whereas they engrave the block itself. In the former case it is but a few years since machine printing took the place of hand block printing in figuring calicoes.

This method of producing colored figures on cloths by means of printing, should not be confounded with dyeing, although by a previous protection of those portions of the fabric not intended to be colored, dyeing has been employed to make figured cloths. Printing deposits the colors directly upon the cloth, which are secured there by mordants. This art, brought from the East, found its way into England about the year 1676. We will briefly describe the process formerly used.

"Block printing" of calicoes was comparatively a simple process. The web of white cloth was sent to the printing shop, either in a bleached state, or dyed some color which formed the ground. Previous to being submitted to the manipulations of the printer it was "calendered," or pressed between heavy rollers, which gave it a perfect surface. It was then ready for the printer. He worked at a table, wide enough to accommodate the fabric, and six or seven feet long. The roll of plain cloth lay at one end of the table on a platform, and was drawn up over the table, which was of stone and covered with a thick felt blanket. Behind him was a tub, some thirty or thirty-six inches diameter, partially filled with a mixture of common pitch and a vehicle which held it in solution. Floating on the surface of this yielding mass was a piece of woolen cloth stretched tightly over a hoop. A pot of the requisite color stood at the side, and the attendant, or "tearer," as he was called, with a flat brush smeared the hooped woolen sieve with the color. The printer was furnished with a "block," corresponding in length and width with the pattern to be printed, the face of which was cut in relief, as are the blocks used now in printing wood cuts. By dipping lightly the block in the sieve, floating on the yielding surface, it took up enough of the color to make an impression on the cloth. The cloth being drawn tightly over the table presented a smooth surface, upon which, by repeated applications of the block, its pattern was produced and reproduced indefinitely, the "tearer" smearing the sieve with fresh color in each interval. The printer was guided in placing his block by a minute pin inserted at a corner of his block. The cloth on the surface of the table being printed, it was wound up over rollers traversing the room on racks, so that when it came back by the series of rollers to the end of the table, it was wound perfectly dry upon a shaft, from which it was taken to be "lived" or "raised."

This is, in brief, the *modus operandi* of block printing in its simplest form. It will be seen that several applications of the block were required to cover one single transverse section of the fabric, and many repeated applications to print a full web of thirty or forty yards in length. Sometimes the ground itself was applied by blocks. In such a case the figure was first printed with the block cut in relief, and then the fabric was reprinted with a block cut in intaglio, the figure being sunk into its surface, and the surface itself being faced with woolen or felt, to convey a large portion of the coloring matter. Another style was that of printing several colors or shades at once by means of an apparatus which fed different colors at the same time. Technically this was termed a "hokey-pokey" tub. The deposition of the colors, held in reservoirs, was effected by the pressure of the block, in dipping, acting upon compressed air.

This block printing is still employed in the printing of silk handkerchiefs, each one of which is a single pattern, and largely in the printing of floor and table oil cloths. In the latter case the coloring matter is not a dye, but a paint, and is deposited mainly on the surface of the fabric.

Machine printing by means of engraved copper rollers, has now taken the place of block printing, and that we shall make a subject for another article. When machine printing was first practiced in England and France, the colors used were not deemed "fast," and much prejudice was excited against the product of the new process. Hand-printed calicoes were eagerly sought after, and as the process of hand printing could not be so accurate as that done by machinery, those who studied economy rather than show, sought eagerly, in their selection of calicoes, for evidences of faults to make sure that they were getting the genuine article. The shrewd suppliers of our markets abroad soon ascertained the

fact, and sent to this country imperfectly-printed goods, printed by machinery, to suit the queerly-fastidious tastes of the purchasers in the American market. Labor-saving machinery, however, ultimately triumphed over old and slow processes, and the days of block printing were numbered.

UNSCIENTIFIC INVENTORS.

In a discussion before the British Association, at its recent session, Mr. Felkin stated that since 1780 no less than six hundred and sixty patents for inventions connected with the lace manufacture had been granted, all of which, but some half dozen, had been made by the workmen themselves, while during the last fourteen years machinery to the value of two millions of pounds had been laid aside as being unfitted for the attainment of the result desired.

It may seem strange that so many patents have been taken out for one branch of industry, but we think the sewing machine and the steam engine, as individual improvements, would show a more wonderful fertility of talent, although possibly both of them combined would not exhibit so many separate inventions. The manufacture of lace is an intricate process, and since the first introduction of lace as an ornament of wearing apparel, several hundred years have elapsed. It was first made entirely by hand with a patience of application and an untiring energy like that of Bruce's spider; but when machinery, created by the inventive genius of man, usurped the place of the patient, plodding "pillow lace" workers of Germany, a vast field was opened for improvement in the processes of the manufacture.

As a means of accounting for this large number of inventions in this one branch of industry, it was stated that the want of a scientific knowledge of mechanics was the probable cause, the unscientific workman not having a comprehensive and clear idea of the means necessary to produce the result desired, feeling his way and toiling by slow steps toward the attainment of his object. There certainly is a good deal of force in this supposition, yet we can scarcely subscribe to the idea which seems to be embodied in it, that inventions when discovered by scientific mechanics are always, or even generally, produced as finished and perfect creations. There may have been cases where an invention became at once a success, incapable of radical improvement, soon as embodied in a practical form; but such instances are rare. Improvements in mechanism are of gradual growth, accretions, and not springing complete, perfect, and ready armed from the brain of the inventor, as Minerva from the head of Jove. Genius, however much the popular idea may elevate it above plain, plodding talent, is always a worker; and he who hopes by the aid of science to leap at once to the goal desired will be disappointed. In the progress of invention the object to be attained is the first element, the second the means to be adopted, and both these must be reached by patient removal of obstacles and gradual surmounting of difficulties as they arise. It requires a prescience more than human to foresee and provide against all contingencies in the perfection of an invention. Practical experiments are the means by which the inventor reaches success, and no amount of theoretical knowledge and scientific attainment will open a royal road to inventive success.

Yet it is as certain that science, and an intimate knowledge of the laws of mechanics, much shorten the labor of putting a mechanical idea into a practical form. Indeed, if the inventor is destitute of this knowledge, he must expect that the obstacles in his way will be increased in number and become more formidable in character. He will blunder where he should conquer, and will repeat the futile experiments of others in endeavoring to violate, or nullify, the plainest laws of mechanical science. To this ignorance must be attributed the persistent and repeated attempts to construct a self-acting and power-generating machine—a perpetual motion. A lamentable instance of the necessity of at least a general and superficial acquaintance with the simple laws of motion came to our knowledge a few days ago. A correspondent desired to know some means by which an eccentric, or crank, could be made to advance a valve forward eight inches and bring it back only four and a-half inches. He seemed to have the idea that all things were possible to mechanics.

While it cannot be denied that the work of the inventor is a slow and laborious one, even with all the aid which scientific knowledge can render, it is no less true that this knowledge will avail to protect him from the chagrin and disappointment of repeated failures. At least a certain familiarity with the general laws governing matter, if not a knowledge of mechanical movements, is requisite to success in mechanical invention.

Correspondence

Steps for Turbine Wheels.

Messrs. Editors:—On page 85, current volume of the Scientific American, under "Notes and Queries," I notice your answer to M. E. of N. Y., on the subject of steps for turbine wheels. You say lignum-vitæ, rock maple, or hickory, prepared by boiling in oil, and used with the grain parallel with the shaft, would make as good a step as he could obtain. To the above you might add live oak prepared in the same way, and for the benefit of M. E., and the numerous readers of your very valuable paper, allow me to inform them that the knot of the Southern pine, commonly known as lightwood knots, from its rapid ignition, makes the best step. I do not believe it is much known at the North, but in North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Florida, where it abounds, this knot is well known and has been tested with live oak, hickory and dogwood, and proved superior for steps. There is no necessity of boiling it in oil, as it is full of resin and sticky to the touch, is very hard and brittle; a nail cannot be driven into it without fracturing it in some way, the fracture running as often across the grain as with it, resembling much the first fracture of ice when a sharp pointed instrument is driven into it.

For further information I have procured three dry or seasoned specimens, which being accurately dressed to 3 inches square by 6 inches long, and weighed on scales denoting one-fourth ounces, give the following results:—

1st—3×3×6=54 cubic inches, weighed 2 lbs. 5½ oz.
2d—3×3×6=54 cubic inches, weighed 2 lbs. 4½ oz.
3d—3×3+6=54 cubic inches, weighed 2 lbs. 8 oz.

3×3×18=162 cubic inches weighed 7 lbs. 2 oz. =76 lbs. to the cubic foot. Llignum-vitæ being 83·4 to the cubic foot, it will be seen that these knots are nearly as heavy, and I believe specimens can be procured equally as heavy. They can be had in great abundance from 5 to 10 inches in diameter, and the stump and roots of the tree, equally as good for steps, can be had from 12 to 20 inches diameter.

O. T. Gibbes.

Augusta, Ga.

Black Oxide of Manganese.

Messrs. Editors:—In answer to "E. H. L. of Mo," in last week's Scientific American, we would state that there are mines of oxide of manganese in California, Ohio, Virginia, and near St. John, N. B., from the latter of which large quantities are being constantly shipped to the bleaching powder manufacturers of England, beside being extensively used here in the manufacture of glass, steel, varnish, refining of coal oil, etc. For the manufacture of crystal glass, which requires the best article of manganese, the New Brunswick has been pronounced by New York, Boston, and Pittsburgh manufacturers equal to the best Saxon.

Merritt W. Griswold & Co.
Agents for N. B. Manganese Mines.

New York, Sept. 14, 1866.

Measuring and Regulating Temperature.

Messrs. Editors:—I notice on page 115, current volume, you invite subscribers to come to the rescue of Mr. Brown, in the matter of regulating temperature. In response, I would suggest that he take his compound bar, or "thermostat," and knock out all the rivets but one, at one end; then take a strip of steel, one inch wide, two feet long, by one-sixteenth of an inch thick, drill two holes near one end, perhaps one-quarter inch apart, in line with the length of the piece, then rivet through one hole to the steel, and through the other to the brass bar, so as to let it form nearly a right angle; the other end of this arm will then describe an arc of some extent, as the temperature varies. Now let him find by trial what point of this arm "moveth itself aright," and then connect with his valve—having placed the apparatus in a suitable position—and it strikes me it will work with sufficient power to answer his purpose. The rivets must not be too tight, and the long bars must be confined sufficiently to prevent buckling.

Enos Grout.

Fall River, Wis.

A Meteorological Phenomenon.

Messrs. Editors:—A phenomenon was witnessed here yesterday, at about half past five P. M., which I deem worth reporting. A brisk shower was followed by a rainbow of most intense brilliancy, and characterized by other features of more than ordinary interest. Not only were both the arcs remarkably perfect and distinct, but the space between them exhibited a very decided shade of color, which, without assuming to speak with entire accuracy, I should say was between violet and purple; so that a portion of the mountains behind, when seen through the medium of this colored space, was considerably darker than the adjacent parts. There was also plainly visible a duplicate of the violet or innermost band of the lower arc, and separated from it by a dark lead-colored band of about the same width as the duplicate, and both of them very clearly defined. A third curious feature of this scene was the fact that the primary or lower arc was in many places crossed and obscured by what seemed to be clouds which had arranged themselves in the form of radii of the circle of which the arc was a part. Their form was not that of rays of the sun as seen through clouds at sunset, but rather that of the irregular streamers or patches of aurora borealis, except that they were of the color of the other clouds, and had not the motion of auroral flashes. Had these streaks occurred only at the crown of the arc or vertical to the earth, it might be thought they were the ordinary appearance of rain falling from a distant cloud; but, in fact, they were much more plentiful at the ends of the arc than at top, and were unmistakably arranged with reference to the center of the circle. They also continued as long as the arc was visible.

J. R. Leute.

Washingtonville, N. Y., Aug. 24, 1866.

Origin of the Signs + and —.—A recent writer in the *London Athenæum*, gives the following as the origin of the signs + and —. He says: The first of these signs is a contraction of *et*. The course of transformation from its original to its present form may be clearly traced in old MSS. *Et* by degrees became &, and & became +. The origin of the second (—) is rather more singular. Most persons are aware that it was formerly the universal custom, both in writing and printing, to omit some or all of the vowels, or a syllable or two of a word, and to denote such omissions by a short dash, thus —, over the word so abbreviated. The word *minus* thus became contracted to *mns*, with a dash over the letters. After a time the short line itself, without the letters, was considered sufficient to imply subtraction, and by common consent became so used. Hence we have now the signs + and —.—*Annual of Scientific Discovery.*

The Philadelphia *Press* notes the setting of a mill on fire in that city by the engineer attempting to temper a spring by plunging it, red hot, into a can of lubricating oil. The oil exploded and set the building on fire. It evidently was mineral oil, as no animal or vegetable oil contains explosive elements. This may serve as a warning to those using petroleum as a lubricator. The experiment was a foolish one, for mineral oil is totally unfit for the purpose of hardening steel.

Cleaning horses by machinery is announced as the latest English improvement.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

WHIFFLETREE.—FRANK CLEMANS, Lafayette, Ind.—This improvement consists in the combination of a spring and pin with a clevis or strap having for its object a means of detaching the horse or horses from the vehicle in case they become unmanageable and likely to peril and jeopardize the lives of the occupants of the carriage.

REGULATING REGISTER FOR TIMEKEEPERS.—WM. M. BEEMAN, Hartford, Conn.—This invention consists in the employment of two registering devices in connection with the ordinary regulating lever of a watch, one register being used to record the deviation of the watch during any given space of time, and the second register being to record the distance and direction which the regulator is moved the first time for correcting the said deviation; so that the regulation of timekeepers is, in this manner, reduced to a simple calculation, and the correct point for setting the regulating lever is readily found after the first set of observations. The process is much simplified, and has important advantages over the rambling method by which the correct point for setting the regulating lever has heretofore been found.

FAUCET.—G. R. HUNTLY, Taunton, Mass.—This invention consists in the employment of a screw clamp in combination with an adjustable coupling or nozzle in such a manner that the nozzle may be adjusted to any desired point or may be removed.

COMBINED WHEAT DRILL AND ROLLER.—ORSON ARMSTRONG, Gillespie, Ill.—This invention consists in so constructing a machine that wheat may be sown in drills by it, and it may be used for a corn planter. It is also provided with rollers so as to roll the ground after the planter.

PLOW.—TILLMAN RAMS, Keokuk, Iowa.—This invention consists in providing a socket in the point of a plow for the purpose of admitting the end of the shoe or bar upon the lower edge of the landside for the purpose of fastening and securing the same to each other.

IRON FOUNDER'S CLEANING MILL.—STEPHEN D. HORTON, Peekskill, N. Y.—The object of this invention is to furnish an improved cleaning mill by means of which the metal remaining in the material left in the furnace, when the melted metal is drawn off, after being crushed or ground, may be separated from the dirt readily and without waste of the metal.

OX YOKE.—E. G. GALE, Holland, Mich.—This invention consists in securing the bows to the yoke by means of a rack bolt in combination with a toothed segment engaging with the teeth of such bolt and operated by a suitable lever or handle.

WAGON BRAKE.—THOMAS T. WIER, Gallatin, Mo.—This invention consists principally in the combination with the neck yoke, tongue, forward bolster, and brake bar, of a rod jointed in two places, to accommodate it to the upward and downward movement of the tongue and to the right and left horizontal movement of the forward wheels in turning.

CONDENSER.—J. C. WHARTON, Nashville, Tenn.—This invention has for its object to furnish a condenser by means of which the products of distillation may be condensed quickly and thoroughly. And it consists of a number or series of hollow disks connected with each other and placed in a water tank.

SPRING DIRK KNIFE.—CHAS. HIBBARD, Chicago, Ill.—This invention consists in the employment or use of a spiral spring placed behind, or in the rear of the blade, for instantly throwing out the same, no matter what position the knife may be in when the blade is released.

FENCE.—SAMUEL CROCKER, Oakland, Iowa.—This invention consists in the combination and arrangement of the stakes or braces and binding bar with the adjacent ends of the linear panels, and in connecting the adjacent ends of the panels at the corner with each other by passing the notched projecting ends of the horizontal bars of the one panel through mortises formed in the end upright of the other panel, and securing them in place with keys or wedges.

BRAKE FOR SLEDS.—H. L. NARAMORE, Cummington, Mass.—The nature of this invention consists in the employment of two pivoted levers, one end of each being connected to the pole at its rear end, and the other ends connected by rods to elbow levers that connect with the brake.

COMPOSITION FOR PRINTERS' ROLLERS, ETC.—LEANDER R. BINGHAM, New York City.—This invention relates to a composition which is intended particulary for printers' rollers, but which can be used for a great many other purposes, in some cases as a substitute for india-rubber. Its properties are such that it readily takes up printers' ink, and that rollers or other articles made from it preserve their softness and elasticity for a long time.

FASTENING FOR CARPETS, ETC—CHRISTOPHER GULLMANN, Poughkeepsie, N. Y.—This invention consists in the arrangement of flat or concave rods which are provided with teeth bent down from one or both edges in combination with screws or other suitable means for fastening the same to the floor, so that by such rods a carpet or any other textile or flexible fabric can be readily stretched and held in position, and by removing the rods the carpet or other article can be taken up without injury.

LAP JOINT FOR BELTING.—HENRY UNDERWOOD, New York City.—The object of this invention is to furnish an improved lap joint, by the use of which a belt of nearly uniform thickness and strength may be produced, and at the same time the amount of stock used may be economized.

VALVE FOR WATER-SUPPLY PIPES.—WILLIAM KEARNEY, Belleville, N. J.—The object of this invention is to obtain a valve for water-supply pipes which will not be rendered inoperative by means of stones, sticks, or other foreign substances interposing themselves between the valve and its seat. The invention has also for its object the ready starting of the valve under a heavy pressure of water, and a quick and rapid movement of the valve after the same has been started, and a suitable provision made for the escape of air from the valve-chest, and to prevent the freezing up of the valve in its chest.

FRUIT DRIER.—WILLIAM D. FISHER and WILLIAM HOLLY, Freeport, Ill.—This invention consists in having a double flue in combination with the furnace and drying chamber of a fruit drier, for the purpose of causing a draught through said drying chamber, and in a fruit tray formed of lath and canvas, in combination with the furnace and drying chambers, and with the walls of a fruit drier.

CURING RHEUMATISM, ETC.—LOUIS FOUILLOUX, Clermont Ferraud, France.—This invention consists in the external application of oxygen gas, in conjunction with heated atmospheric air, to the parts of the human body which are afflicted by rheumatism and other similar diseases, in such a manner that the vitality of said parts is renewed and increased, and the diseases are counteracted and cured.

APPARATUS FOR MAKING VINEGAR.—THEOD. GRUNDMANN, St. Anthony, Minn.—This invention relates to an apparatus in which the liquid which is to be transformed into vinegar is made to pass through a series of troughs, which are placed in a slightly inclined position and covered up, leaving air channels which allow the atmospheric air to circulate freely over the surface of the liquid passing through the troughs in such a manner that if said troughs are first saturated with vinegar, and beer, cider, or other suitable liquor is passed through them, said liquor is transformed into vinegar, and all danger of overheating or putrefaction is avoided.

PISTON PACKING.—A. W. JACKSON, Centralia, Ill.—This invention has for its object to furnish an improved piston packing, simple in construction and self-adjusting, in which the pressure of the packing against the inner surface of the cylinder shall be in exact proportion to the pressure of the steam upon the face of the piston.

WHEEL FOR VEHICLES.—RICHARD WALKER, Batavia, N. Y.—The object of this invention is to furnish a means by which the tire of a wheel may be tightened without resetting the tire.

MACHINE FOR STRIPPING FILE BLANKS.—T. COLDWELL, Matteawan, N. Y.—This invention consists in so constructing the holders for the file blanks as to receive and hold blanks of varying lengths, and also in so arranging them that, while the file blanks will be firmly held to the action of the stripping tool, they can adjust themselves thereto; and also in imparting to the stripping tool a reciprocating rectilinear movement over the file blanks in the direction of their lengths, so that, without arresting the movement of the stripping tool, the blanks can be removed from the machine, and reversed in position or new ones inserted, as may be desired.

SEAMLESS POCKETS FOR GARMENTS, BAGS, ETC.—GUSTAVE KOTTGEN, Barmen, Prussia.—This invention has for its object the production of seamless pockets for garments and seamless bags, in order to secure, among other things, the qualities of durability, strength, economy of labor in preparing them; and it consists in producing them by weaving them whole and complete in a loom, without any seam whatever.

MUSICAL INSTRUMENT.—GEORGE C. WOODS, Cambridge, Mass.—The object of this invention is to improve the manner of operating the stops of musical instruments.

CARRIAGE SEAT.—LUTHER J. WOODRUFF, Mohawk, N. Y.—This invention relates particularly to that class of carriage seats known as "tub seats," and it consists in the use of metallic castings for the corners of such seats, whereby a great saving is effected both in the expense and labor of manufacturing, at the same time securing increased strength and durability, as well as superiority of finish.

FIRE-ARM.—F. SCHENK, San Antonio, Texas.—This invention relates to the arrangement of a hair trigger for Colt's and other revolving pistols, which is so constructed that it may be adjusted to any one of said pistols without the assistance of a gunsmith, the only tool required for the purpose being a screw driver.

PORTABLE FIELD FENCE.—JER. WHITESIDE, Coesse, Ind.—This invention has for its object to furnish an improved fence, strong and substantial, without its being necessary to set posts in the ground. It is so constructed that the timber will have no chance to warp or twist, and is so bound together that there will be no strain upon the nails.

STEAM GENERATOR.—C. S. BELL, Hillsboro, Ohio.—This invention relates to an apparatus for generating steam, and has for its object economy in fuel, safety from explosions, and an economical mode of construction.

CULTIVATOR.—WILLIAM J. ANDREWS, Columbia, Tenn.—This invention relates to a cultivator designed for scraping, harrowing, and thinning out plants which are grown in elevated or raised drills, such as cotton, etc.

CUTTING STANDING CORN STALKS.—J. M. GOFF, Ionia, Ill.—This invention relates to a machine for cutting standing corn stalks, and it consists in the employment or use of a cylinder of knives connected with a draught pole and arranged with adjustable wheels, whereby standing stalks may be cut with the greatest facility and very expeditiously, so as to effect a great saving in time and labor over the manual process for effecting the result.

PLOW ATTACHMENT.—O. P. DILLS, Falmouth, Ky.—This invention relates to an attachment for plows whereby any ordinary plow may be converted into a riding or sulky plow.

CULTIVATOR.—JOHN BURNHAM and W. C. LATTRUP, La Salle, Ill.—This invention relates to a cultivator of that class in which the plows are arranged so as to be adjustable both laterally and vertically, and it consists in a novel arrangement of the parts, whereby the device may be manipulated with the greatest facility, the team relieved of weight on the neck, and the device rendered capable of being converted into a single or double one for plowing one or two rows of plants.

CUTTING RUBBER THREADS.—D. W. RUST, East Hampton, Mass.—This is an improvement in the mode of cutting rubber threads, by which the work is accomplished without waste and imperfect incision of the folds of rubber next the revolving cylinder, on which the threads are cut.

WINDOW-SHADE FASTENING.—E. J. STEEL, New Britain, Conn.—This is an improved device for fastening window shades, operated by a single cord, and raising and lowering easily.

GOVERNOR.—THOMAS B. MCCONAUGHEY, Newark, Del.—The governor embraced in this invention is intended more especially for horse-powers, the invention consisting in a novel construction and arrangement of the parts composing the governor, whereby efficiency and perfectness of operation are secured.

SUGAR EVAPORATOR.—ROBERT C. NOURSE, Corydon, Ind.—This invention relates to certain improvements in means for stirring and skimming the juice of the sugar cane during the process of evaporating and concentrating it, whereby the labor attending the usual manipulation is greatly diminished, and the work effected in a thorough manner.

SULKY ATTACHMENT FOR PLOW.—STEPHEN STOUT, Tremont, Ill.—This invention relates to a simple sulky attachment for plows, whereby any ordinary plow may, with the greatest facility, be applied to the attachment and converted into a sulky plow.

WATER WHEEL.—JOHN S. WARREN, Portchester, N. Y.—This invention relates to a horizontal water wheel, and it consists in a novel construction of the scroll and wheel, whereby the water is allowed to pass through the wheel with less interruption than hitherto, and with less friction and a greater percentage of the power of the water obtained.

CAR COUPLING.—DAVID LIPPY, Mansfield, Ohio.—This invention relates to a self-acting car coupling, one which will connect itself when the cars come in contact, and which will disengage itself in case of a car being thrown from the track. The invention is applicable to either passenger or freight cars.

MILL FOR CRUSHING SUGAR CANE.—ALVAH EATON, Madison, Wis.—This invention consists in an arrangement of pressure rollers and a frame, whereby it is believed that a very superior mill for the purpose specified is obtained.

MACHINE FOR SOWING WHEAT, ETC.—CYRUS C. CARTER, Exeter, Ill.—This invention relates to a device for sowing wheat and other grain, either in drills or broadcast. The invention consists in a novel arrangement of runners, and furrow openers, and seed-conveying tubes, whereby the desired work may be perfectly performed by a very simple arrangement of parts.

CULTIVATOR.—M. H. BUCKNALL, Darien, Wis.—This invention relates to a cultivator for cultivating plowed ground, eradicating the weeds therefrom, and pulverizing the soil.

SHEEP AND CATTLE-FEEDING RACK.—J. B. BROWN, Medina, Wis.—This invention consists in a rack having its roof and division-boards pivoted or hinged in such manner that the frame can be opened and the latter placed so as to shield the troughs when the device is to be used as a cattle-feeding rack, and so that the roof may be closed and the division boards thrown up so as to leave free access to the troughs when the device is to be used as a sheep-feeding rack.

SPIKE DRAWER.—SAMUEL HART and JOHN DOUGLASS, Prentice, Ill.—This invention consists in constructing the spike drawer with a joint, in such a manner that it can be used in either an extended position, after the manner of ordinary claw bars, or in a position with the part that carries the claw at an angle with the other part or handle.

RAILROAD CHAIR.—B. MCDEVITT, Belvidere, Ill.—The chair embraced in this invention is secured to the rails by means of the wedge driven into one side of the chair in such a manner as to tightly bind it about and in contact with the rails.

COMBINED SHEEP SHED, HAY CRIB, AND GRAIN TROUGH.—T. P. SIBLEY, Oberlin, Ohio.—This invention has for its object to furnish a convenient means for feeding sheep with grain and hay, and which will at the same time afford them a shelter while feeding.

CONSTRUCTION OF DAMS AND LEVEES.—BENJAMIN BRITTEN, Galena, Ill.—This invention consists in constructing dams and levees in a series of layers or steps, so that should all above any particular layer or step be removed, the remaining part will still constitute a perfect dam.

COVERED VESSELS.—S. E. SOUTHLAND, Jamestown, N. Y.—This invention is designed to so improve the covers of tubs and other vessels, when used to contain butter, lard, etc., as to make them air-tight or nearly so, and, at the same time, much more convenient in use.

SELF-ADJUSTING POLE AND POST PULLER.—IRA HOLMES, South New Berlin, N. Y.—This invention is designed to furnish an improved instrument for pulling hop or other poles or posts out of the ground quickly and easily, and it consists in the combination of a standard, lever, and hook with each other.

MACHINE FOR PURIFYING GAS.—WILLIAM C. TURNBULL, New York City.—This invention relates to an apparatus for purifying gas, which is both self-feeding and self-discharging, and in which the gas is claimed to be purified in the most effectual and economical manner.

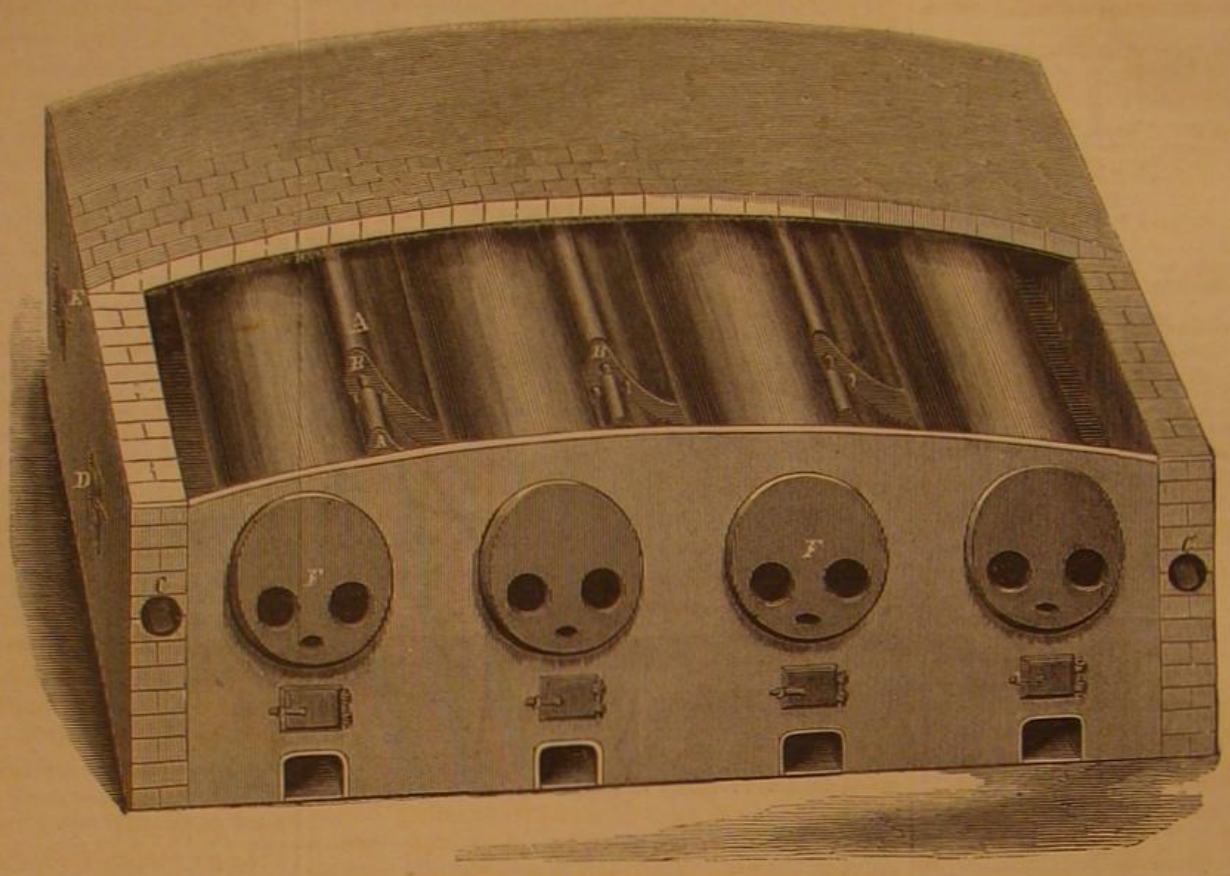
BUCKLE.—T. B. BUNTING, New York City.—This invention relates to an improved buckle for shoes, clothing, or harness, by which two straps may be effectually held together, and by which the sewing of one of the straps to the buckle, heretofore necessary, is altogether dispensed with.

PEW AND SEAT HAT RACK.—E. S. BLAKE, Pittsburgh, Pa. Patented Aug. 14, 1866.—This is a useful contrivance for holding gentlemen's hats in churches, theatres, or lecture rooms. It consists of a V-shaped wire or rod, attached under the seat, into which the hat is pressed, the rim resting on the wire, thus preventing contact with the floor. The use of this rack obviates the liability of the hat getting lost or crushed in a crowded assembly room, and is one of the small but useful improvements which we are always glad to see adopted.

SAFETY BRAKE FOR CITY RAILROADS.—J. WYATT REID, New York City.—This invention consists in a downward extension of the car-brakes so that they will sweep obstructions from the track. The especial object is to save life and limb when, by accident, any person falls upon the track. It is a good idea.

Improved Boiler Furnace.

Boilers set in pairs or groups, in the same bench, do not always operate alike. If the chimney or smoke flue is situated opposite the ends of the central boilers, steam is more easily and rapidly generated in them than in the outer boilers. Consequently these boilers are more exposed to the action of the inflammable gases, and sooner burn out, than those further removed from the line of the egress of the gases. The object of the improvement, illustrated in the engraving, is to regulate and equalize the passage of the smoke and gases along and around the boilers.



CLARK'S BOILER FURNACE.

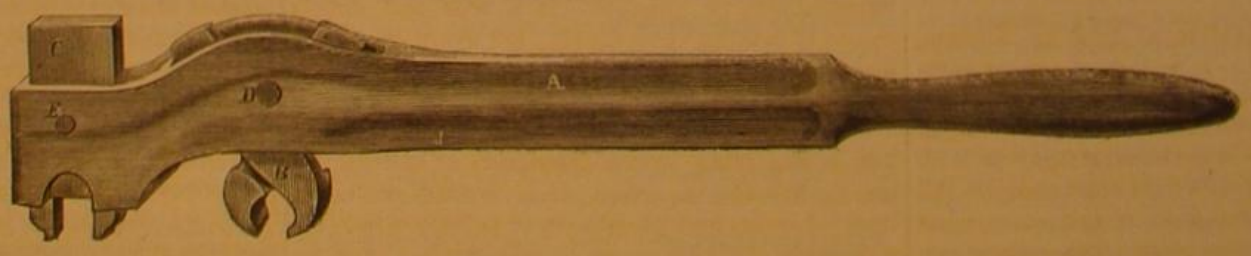
The engraving represents a bench of four cylindrical boilers, disposed horizontally. The usual flue space, semi-cylindrical, extends under the boilers and reaches up to their centers, the ridge of intersection forming a longitudinal partition, which is shown at A. Above this point the connection between the outer flues is open and free. A transverse passage, B, extends across these partitions from side to side, communicating at each side with longitudinal passages through the side walls which run from front to rear, and open to the external atmosphere at C. A door, D, on each side, communicates with this transverse passage, for convenience in cleaning. A flue, not shown, is carried across through this passage, which is furnished with tubes, B, projecting upward at an angle. These tubes, in connection with the flues, C, furnish air to the gases and aid in their combustion. The flues under and along the sides of the boilers, with the air passages. C, debouch into a transverse channel—door shown at E—at the rear of the boilers, where the smoke and gases are received and returned through the boiler flues, F.

These furnaces are largely in use at the West and give general satisfaction. The inventor is so confident of their superiority that he offers to put them up for the value of the fuel saved in two months by their use.

Patented through the Scientific American Patent Agency May 9, 1865, by Thomas H. Clark, to whom, at Box 814, Indianapolis, Ind., apply for further particulars.

Improved Nail Extractor.

Boxes containing merchandise are often greatly injured, if not entirely destroyed, in opening, and the nails are either bent or broken so as to be unfit for further service. The little instrument herewith illustrated is a very convenient and efficient implement intended to save this destruction. It is a handle, A, of malleable iron pierced by two mortises containing the tongs, B, and the die, C, both of cast steel. The mortise through which B passes is much wider at the top than the bottom, and the tongs are secured by the pin, D, in combination with the walls of the mortise, from dropping entirely through. The inclines of the walls act as gripes, as the end of the handle is raised, to close the jaws of the tongs. The pin, E, passes through a slot in the die, C, to retain it in place.



HOGAN'S NAIL EXTRACTOR.

The operation can be easily comprehended. The jaws of the die, C, are placed over the head of a nail, and a sharp blow on the die indents the wood on each side the nail head. The tongs are then moved to the nail, and as the jaws drop into the indentations, the raising of the handle causes them to grip and draw the nail out without breaking or bending. The box or packing case is thus preserved for future use, and the nails are fit to be again employed. The advantages of using this simple and durable implement will be patent to all. It is an exceedingly neat and efficient tool.

These implements are made of two sizes, the larger for shipwrights and bridge builders, and the smaller for merchants and common use. This is only thirteen inches long and weighs one and a-quarter lbs. Patented May 29, 1866, by John H. Hogan, who may be addressed for further particulars at East Saginaw, Mich.

SHODDY---ITS MATERIAL AND MANUFACTURE.

The term "shoddy" is of recent date, at least in this country, and by means of a popular prejudice, has become a term of reproach to a certain class. At the beginning of the war it was found difficult to procure clothing for the large army, drawn, by the necessities of the country, from the avocations of civilians to the duties of the camp; and the necessities of the Government and the needs of our soldiers demanded a ready means of clothing thousands. The adaptability of shoddy suggested the idea that the refuse of woolen rags might be utilized as a component of cloth, while we were contracted in the procurement of raw wool.

The manufacture of shoddy in this country to an extent calculated to attract the attention of the public, dated from the commencement of the war. Some years before it had been noticed as being a necessary ingredient in the substance of table and piano covers, which showed a wool pile in raised figures, resembling the products of silk manufactured into velvet. This use of the material as a portion of the "filling" of woolen woven fabrics was perfectly legitimate, and is as popular now as ever. But it has been for some years used as a part of the fabric itself, and is carded and spun as a portion of the cloth with long stapled wool.

Shoddy is the wool of worn rags, clothing, carpets, etc., which have served their day in their primitive form and are put to baser uses, or compelled to serve a second probation in the same line. The rags are assorted as to color and quality, and are then fed into a machine similar to a carding machine for ordinary wool or cotton, except it is much stronger than these. The machine is a cylinder of iron, three, or three and a-half feet diameter, and twenty inches across the face. On the periphery lags of hard wood are fastened, filled with pins forged from steel one-eighth of an inch square, which project above the surface about two inches. These pins are driven through the wood in holes drilled to the size they are when forged (for every pin is forged to a point from the square steel), and the bases rest upon the face of the cylinder. The armed lags are then secured to the cylinder and faced to an even surface.

This cylinder revolves with great rapidity, while the rags are fed into its surface by means of fluted steel rollers. The teeth tear the rags to pieces and the wool comes out in a lint-like, disintegrated mass. This shoddy is really a very short stapled wool. The wear and weakening by dirt and dust, to which the rags in their previous condition of cloth have been subjected, tend, of course, to injure the quality of this short stapled wool. But where shoddy is made of knit articles, composed of Berlin or zephyr worsted, which is wool of very long fiber, it requires the experience of an expert to distinguish it from true wool. This quality can be used in the fabrication of cloth of good grade.

The shoddy for cloth is mixed by carding with unmanufactured wool, and spun into thread to be used for "filling," as it lacks the tenacity necessary for the "warp." Its principal advantage is to give "body" to the cloth. Usually not more than thirty-three per cent of shoddy is employed, as a larger proportion would injure the cohesiveness of the fabric. In the manufacture of wool hats it is sometimes used, but not extensively. It furnishes the beautiful pile on the elegant house paper known as velvet hangings, and as a felt, locally applied to prevent the radiation of heat, is coming extensively into use. Its manufacture has given a value to woolen rags, before considered worthless except as a fertilizer, and provided employment for thousands. Like many other valuable articles, its advantages have been abused.

The Onondaga Salt Works.

From the report for 1865 of the superintendent of these works, Mr. George Geddes, and a note accompanying it, we find that during that year the production of salt from the springs was 2,928,187 bushels. From 1797, the date of opening the spring, to the present time, the product was 168,698,569 bushels. The largest amount was reached in 1862, when 9,053,874 bushels were manufactured. It requires the evaporation of 38·4 gallons of water to manufacture one bushel of salt of 56 pounds. A singular statement in the report is that the conduits for conveying the salt water from the wells to the different manufactories are greatly clogged by a sediment deposited by the water, which sediment is composed principally of oxide of iron. The conduits or pipes are of logs, bored and strengthened at some points with iron bands. Between thirty and forty miles of these pipes are in use at the works.

THE

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.

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

☞ "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.

VOL. XV., No. 13, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, SEPT. 22, 1866.

Contents:

(Illustrated articles are marked with an asterisk.)

*Grier & Boyd's Machine for Twisting Augers	195	Steps for Turbine Wheels	200
Nitro-glycerin	195	Black Oxide of Manganese	200
The "Bellerophon."	195	Measuring and Regulating Temperature	200
The Art of Dining	196	A Meteorological Phenomenon	200
Items from the British Association	196	Origin of Signs	200
Improvement in the Construction of Artesian Wells	196	New Inventions	201
Armor-plate Fastenings	196	*Clark's Boiler Furnace	202
Austrian Manufactures Injured by the War	196	*Hogan's Nail Extractor	202
Interesting Acoustic Phenomenon	197	Shoddy—Its Material and Manufacture	202
Reproduction of Drawings, etc.	197	The Onondaga Salt Works	202
An Invention Wanted	197	The Final Fate of the Universe	203
The Iron and Copper Resources of Great Britain	197	A Word to Inventors and Patentees	203
Patent Hair Restoratives	197	The Anglo-French Cnannel Tunnel	203
Miscellaneous Summary	197	Wood and Mann's Portable Engine	204
English Railway Carriages	198	Patent Office	204
*Myer's Stooper and Discharge Spout	198	Patent Claims 204, 205, 206, 207,	208
Traction Engines and Roads	198	Notes and Queries	209
On Coloring Photographic Slides for Magic Lanterns	198	Advertisements	209, 210, 211
Fire-Lighting in Olden Times	199	Improved Combined Steam Engine	212
Printing on Woven Fabrics	199	*McGill's Ship Windlass and Coil Separator	212
Unscientific Inventors	200	Age of Stone in China	212
		Prospectus	212

THE FINAL FATE OF THE UNIVERSE.

If two bodies were placed in space without any force acting upon either of them other than their own gravity, they would immediately start toward each other, and would rush together. The sun and planets which constitute the stellar system, to which our solar system belongs, are prevented from rushing together into one mass by their revolutions about each other. The revolutions of the planets around our sun, and of the satellites about their primaries, have been ascertained, with that wonderful precision which is the just pride of astronomical science, and astronomers are now engaged in the sublime problem of unraveling the revolutions of the countless suns that make up our stellar system. Already the cluster of the Pleiades is indicated as the proximate locality of the center around which our sun, with his attendant planets, is sweeping his vast orbit; and it is suggested that this is probably the common center of the orbits of all the suns of our stellar system.

If the force of gravity extends across the inconceivable spaces which separate the several stellar systems of the universe, these systems must rush together unless they are held apart by revolutions around each other.

If light were an emanation, as held by Newton, the spaces between the solid bodies of the universe might be absolutely empty; and, in that case, the revolutions of the bodies around each other might go on for ever. On the other hand, if light is a vibration in a subtle fluid, this fluid must obstruct the motions of bodies revolving in it, and they must finally come together in one mass. The experiment, so ingeniously devised by Arago, and carried out with such honorable regard for the fame of its designer, by Messrs. Foucault, Fizeau, and Breguet, to determine whether there is a difference in the velocity of light in its passage through air and through water, has demonstrated that light is a vibration. It follows from this that, as far as light extends, space is filled with a material fluid which resists the motion of bodies revolving in it, and bodies within this space must gradually wind their way inward, and ultimately come together into one mass.

The moon must be drawing very slowly nearer and nearer to the earth, and the two bodies, in the far distant future, will come together. The solid crust of the earth will be broken up by the shock, an immense quantity of heat will be generated by the destruction of the moon's motion, and the two bodies will fuse together into one molten globe. As the new and enlarged earth is cooled upon its surface, a second series of geological deposits will be constituted, accompanied, perhaps, by strange and inconceivable forms of animal and vegetable life.

At the same time, the earth is winding its way inward toward the sun, and must ultimately fall, an inconsiderable pebble, into that vast glowing mass. The same fate awaits all the planets, and our solar system must one day be but a single globe. When this globe is cooled to the right temperature, it may be covered with a multitude of inhabitants, and astronomers may arise who will watch its revolutions among the associated suns of our stellar system. If their knowledge and intellect are equal to the science of our astronomers, they will foresee the ultimate coming together of all these suns into one common globe. And not this only, for they will predict the final coming together of all the stellar systems of the visible universe into one mass of matter.

When this mass is first collected it will be intensely hot from the destruction of motion in the several suns and systems of suns as they come together. The heat will be radiated outward into the universe, and the one mass of matter will be gradually cooled. During the cooling there will be the same play and mutual interchange of heat, light, electricity, magnetism and other imponderable forces that there is now upon this earth. As the cooling proceeds the action of these forces will diminish; when 977 deg. is reached, light will cease, and darkness will fill the universe. As each vibration of heat leaves the surface of the material mass, it will expand outward at the rate of 192,000 miles per second in all directions, in the form of a swiftly-swelling hollow globe. When the temperature of absolute cold is reached (—493·2 deg.), the last vibration of heat will leave the mass of matter and will expand outward through infinity of space and time.

Supposing, however, the ethereal fluid which fills the visible portion of the universe is limited in extent, so that the last vibration of heat will reach its boundaries, and cease, what then becomes of the force of the universe, and of the doctrine of the conservation of force?

A WORD TO INVENTORS AND PATENTEES.

Too many of our inventors seem to suppose their work done and fortunes made as soon as they have filed a caveat or procured Letters Patent, which they seem to believe make their improvements visible and known to the world. A patent is simply a weapon of defense in the hand of the inventor against interlopers and meddlers, and not, as its name imports, a publication of the invention. If a thing is worth patenting it is because it can be made a source of profit to the owner, as well as useful to the world. To shut it up and preserve it carefully from prying eyes, nullifies the object of the patent. To be made profitable it must be made known, must be published and advertised. An advertisement, judiciously worded, and discreetly located in a journal which will reach the class for whose benefit the improvement is projected, is a wise and simple means of making it profitable; but every man prefers to see the article itself, or in lieu thereof, a correct representation of it.

For this reason it is of great importance to publish an engraving, with a description, of an improvement. We are in almost daily receipt of letters from inventors and proprietors of patents which demonstrate the advantage of this course. A good engraving, exhibiting the form, structure, and operation of a machine or implement, is an image that becomes fixed in the mind and when required is easily recalled; whereas words alone, being common to all subjects, lose their force when intended to designate or describe a particular object. Without being justly charged with egotism or vanity, we can affirm that the engravings of inventions published in our columns are not surpassed, if equalled, by those of any other publication, and we endeavor to make our descriptions terse, concise, and easily comprehended.

But whether this or another medium is selected for the purpose, we deem it a duty to inventors to direct their attention to the importance of illustrating their improvements, as a means of attracting the attention and interesting the minds of the public in the consideration of their advantages. The money thus spent is well invested, and the blocks can be used by the inventor—whose property they are—to reproduce indefinitely the cuts for circulars, handbills, bill heads, etc.

THE ANGLO-FRENCH CHANNEL TUNNEL.

A Mr. Hawkshaw has been engaged for several months in making surveys and calculations with reference to a submarine tunnel under the Straits of Dover, in the English Channel, to connect the two countries, France and England. He proposes to sink a shaft on either shore and run adits toward the middle, where he will construct an island, as a half-way station, and erect a lighthouse upon it. The road will be on an ascending grade from each shore to this central station. It is intended that the tunnel shall be used for steam trains exclusively. Mr. Hawkshaw is certain that the excavations, at the points he intends to run his tunnel, will be in a bed of clay, easily worked and affording a good matrix for the structure. He is in receipt of all sorts of advice from all sorts of people. One of the latest of these suggestions is to sink an iron tube suspended by floats or buoys!

There can be but little doubt of the practicability of the tunnel, but it will be a work of many years and extreme cost, and in case of war between the two nations—a not improbable event—would undoubtedly be greatly injured if not permanently destroyed. It is well enough that engineers should keep in the van of progress, but, from this and kindred projects, we are inclined to believe that some of them aim more at notoriety than a desire for usefulness. The Mount Cenis, Hoosac, and Chicago tunnels are neither of them works of such magnitude as this proposed bore, yet, except the last, it is doubtful if either of them will ever prove profitable, or repay the toil and money expended. The Thames tunnel, once considered one of the world's wonders, is practically valueless. Few care to pass through it except from motives of curiosity, similar to those which induce people to visit deep mines or walk under Niagara. Notwithstanding the traditional inconveniences and annoyances of the Channel passage, which is no worse than doubling Point Judith, and not half so bad as crossing the Bay of Fundy, it is doubtful, if this tunnel should be completed, whether people would prefer it to a trip across in a steamer.

Such a work, however firmly built, could not be insured as permanent and safe, and those who have traveled on railroads which have tunnels of only a mile or less in length, and remember what a sense of relief from anxiety they experienced when emerging into God's pure air and light, will not be pleased at the idea of traversing a tunnel of twenty odd miles under the bed of the sea. Mr. Hawkshaw will do better to turn his attention to more feasible and profitable projects, and employ his talents on works which will bring success rather than notoriety.

If railway connection between England and France is desirable, it can be much more easily accomplished than by a tunnel under the bed of the English Channel. A ferry boat of sufficient size, like that in use over the Susquehanna at Havre de Grace, could receive a whole train, locomotive and carriages, and land it on the opposite shore. The dimensions of the boat would be sufficient to insure a comparatively steady motion, free from the pitching and tossing to which the contemptible little tugs now used for the Channel passage are subjected.

ACTION OF LIGHT ON GLASS.—A curious fact is recorded in the *Photographic News*, showing the action of light on glass. A manufacturer of mirrors placed one on exhibition on which was his name in gilded letters. Retiring from business, all attempts to perfectly remove the letters proved fruitless; even grinding and re-polishing failed to obliterate all traces. The only explanation for this is found in the change which the unprotected portion of the glass underwent during long exposure.

COUNCIL BLUFF and Chicago will be united by rail by the first of March next.

The Wood and Mann Portable Engine.

Probably no manufacturers of portable engines are more favorably known than Messrs. Wood & Mann, of Utica, N. Y. They have a large establishment in that city, devoted exclusively, we believe, to the making of portable engines of all descriptions, with power from that of three horses to thirty. In a visit to the establishment in February, 1865, we were greatly interested in observing the exactness and clock-like regularity of every process of the manufacture. Every piece of an engine is duplicated, and every part of the work is conscientiously performed, and all the material used in the establishment is critically selected. Their engines are rated much below their actual capacity; with generous fire surface and ample steam room, their engines stand unsurpassed if not unrivaled, by those of other builders. We feel gratified to have an opportunity to recommend a firm who think more of a popularity and esteem gained by honest endeavor to excel, than of achieving a present profit at the expense of honor. We commend the attention of our readers to the advertisement of this old-established firm in our columns.

Mr. John Edye has calculated that a ship of 120 guns, length 206 feet, breadth 54 feet, 6 inches, and depth 23 feet, of 2605 tuns burthen, will be 5⅞ inches deeper in river water than in sea water, this being owing to the difference of the specific gravity of fresh and salt water. This difference is equal to 143 tuns, 4 cwt., and it takes 24 tuns to immerse the ship 1 inch deeper.

PATENT OFFICE.

PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *twenty years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after so many years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office.

Judge Mason, formerly Commissioner of Patents, says, in a letter addressed to us:—"In all your intercourse with the Office, I always observed a marked degree of promptness, *skill*, and fidelity to the interests of your clients."

Ex-Commissioner Holt says:—"Your business was *very large*, and you sustained and justly deserved the reputation of *marked ability* and *uncompromising fidelity* to the interests of your clients."

Ex-Commissioner Bishop says:—"I have ever found you faithful and devoted to the interests of your clients, as well as *eminently qualified* to perform the duties of Patent Attorneys."

EXAMINATIONS.—If an Inventor wishes our opinion in regard to the probable novelty of his invention, he has only to send us a pencil or pen-and-ink sketch of it, together with a description of its operation. For an Opinion, without examination at the Patent Office, we make no charge, but if a

PRELIMINARY EXAMINATION AT THE PATENT OFFICE

is desired, we charge the small fee of $5. This examination involves a personal search at the Patent Office of all models belonging to the class, and will generally determine the question of novelty in advance of an application for a patent. Up to this time we have conducted over TWELVE THOUSAND Preliminary Examinations, thus showing a more intimate knowledge of inventions at the Patent Office than can be possessed by any other person or firm.

If an inventor decides to apply for a patent, he should proceed at once to send us, by express (charges prepaid) a model not over one foot in size, and substantially made. He should also attach his name and residence to the model.

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 Canadians have to pay $500.

FOREIGN PATENTS.—Messrs. MUNN & CO. have had more experience than any other solicitors in this country in procuring foreign patents, and have old-established agencies in London, Paris, Brussels, Berlin, Vienna, and other large cities. Foreign business should never be intrusted to other than experienced agents.

If an inventor wishes to apply for a patent, all he has to do is to write to us freely for advice and instruction, and he will receive prompt attention. If his invention contains any patentable features, he can depend upon getting his Letters Patent. All communications considered confidential. Send models and fees addressed to

MUNN & CO.,
No. 37 Park Row, New York

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING SEPT. 11, 1866.

Reported Officially for the Scientific American.

☞ 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.

57,838.—Hulling Rice, etc.—William G. Adams, Boston, Mass.

I claim the process of treating grain, seeds, etc., with reference to the removal of the husks or coverings therefrom, substantially as set forth.

57,839.—Self-operating Flood Gates.—William H. Allard and Robert W. Thomas, Portage, Wis.

We claim the gate, B, pivoted eccentrically and arranged to operate in combination with the guards or breasts, C, substantially as and for the purpose set forth.

57,840.—Piston for Deep Well Pumps.—R. N. Allen, Cleveland, Ohio.

I claim the piston of an oil pump when constructed with two chambers separated by the valve check, b'', and a loose flexible packing, I, attached only at the upper and lower ends, with exterior spaces, B', for the passage of the oil around the valve chuck between the metallic cylinder and the packing, substantially in the manner and for the purpose set forth.

57,841.—Cultivator.—W. J. Andrews, Columbia, Tenn.

First, I claim the harrows, g, and scrapers, N, attached to adjustable frames, L, applied to the front part of the framing, A, in connection with the reciprocating thinning hoe, I, all arranged and applied to a mounted frame in the manner substantially as and for the purpose set forth.

Second, The gage, K, applied to the draught pole, J, in combination with the lever, O, attached to the rear end of the framing and connected with the rear end of the draught pole, substantially as and for the purpose specified.

57,842.—Wheat Drill.—A. Armstrong, Gillespie, Ill.

I claim, First, The lever, P R, together with the post or standard, Q, in combination with the pole, S, for the purpose of raising the runners from the ground, all for the purpose and substantially as described.

Second, I claim the cams, c and c' in combination with the levers, G and G', slides, F and H, the cams, C, lever, D, having a continuous alternate motion, and the cams, C, and lever, G', having an intermittent motion, all for the purpose and substantially as set forth.

57,843.—Striking Works for Clocks.—Benjamin Bacon, Morrison, Ill.

I claim, in combination with the count wheel and cam of a clock, a slide, S, provided with pins, a b, or their equivalent, arranged and operating substantially as and for the purposes herein specified.

57,844.—Whiffletree.—F. A. Balch, Hingham, Wis.

I claim the combination of the bar, A, with the bars, C and D, and springs, E and F, substantially as described and for the purpose set forth.

57,845.—Weather Strip.—Robert Bartley, Norwalk, Ohio.

I claim the roller, E, in combination with the slide, m, shaft, l, spring, O, and post, p, for the purpose of rendering the space between the bottom of doors or windows and thresholds or window sills air-tight, and at the same time of rendering the roller capable of passing over carpets or floors without hindrance or wear, substantially as described.

57,846.—Gun Barrel.—A. L. Bausman, Minneapolis, Minn.

I claim, the rod, A, or its equivalent having a slotted and notched sleeve, c, hung upon pins or studs of its lower end, and a spindle, I, capped at its end in combination with the spring or scraper arms, D, when the several parts are arranged and connected together substantially in the manner and for the purpose described.

57,847.—Snap Hook.—Fordyce Beals, New Haven, Ct.

I claim the hook, A, pivoted to the shank of the eye, B, and arranged so as to operate substantially in the manner and for the purpose herein set forth.

57,848.—Register for Regulating Time-keepers.—William M. Beeman, Hartford, Ct.

I claim the registers, B b, and C c, in connection with the regulator, A a, substantially as and for the purpose herein specified.

57,849.—Composition for Printers' Rollers.—Leander K. Bingham, New York City. Antedated Sept. 5, 1866.

First, I claim a compound of glue, molasses or other saccharine matter and alum or other equivalent material, substantially as and for the purpose described.

Second, Also a compound of glue, molasses or other sacharine matter and nitric acid or other equivalent material, substantially as and for the purpose set forth.

Third, Also a compound of glue, molasses or other saccharine matter, alum or other equivalent material, and nitric and other equivalent material, substantially as and for the purposes specified.

57,850.—Hoisting Apparatus.—Henry Black, Carrollton, Ill.

First, I claim the combination of the carriage, D, having the wheels, C C, arranged to travel upon the rod or track, B, and the automatic pawl, I, and automatic brake, G, or their equivalents, when used as and for the purpose set forth.

Second, I claim the construction of the brake, G, in an adjustable manner, so it may be set to any required distance from the sheave, E.

57,851.—Harrow.—Everal Bradley, Clyde, N. Y.

I claim the combination with the triangular central harrow, A, of parallel wings, B B, converging forward in the direction of motion, the connection of said parts being made by the hinges, g h, in such a manner that the wings can be detached at any time, or turned up over the center to weight the same, the whole arranged and operating as and for the purpose herein specified.

57,852.—Dam and Levee.—Benjamin Britten Galena, Ill.

First, I claim the improved mode of constructing dams and levees, substantially as herein described and set forth.

Second, The combination and arrangement of the timbers, A, planks, C, and clay, B, or equivalent, in the construction of dams and levees, substantially as herein described and for the purposes set forth.

57,853.—Sheep and Cattle Rack.—J. B. Brown, Medina, Wis.

I claim the combination of the pivoted or hinged boards, D D, hinged division strips, C C, troughs, B B, and frame, A, all constructed, arranged and operating substantially as herein shown and described.

57,854.—Thill Coupling.—James J. Brown, Madison, Wis.

First, I claim the thill iron, D, having its rear end divided and provided with the cheeks, E, one or both which are provided with a notch, m, for the button to move on, as and for the purpose set forth.

Second, I claim forming the cavity for the reception of bolt, o, and its packing e, by means of the bar, B, having its front end bent as shown, and the front leg of the clip, C, as herein shown and described.

Third, The button, A, pivoted to the clip, C, in combination with the cheek, F, provided with the notch, n, arranged to operate as and for the purpose set forth.

Fourth, I also claim securing the button, A', by means of the stem, b, and nut, c, when used in connection with the packing, e, surrounding the bolt, o, as shown, for the purpose of tightening up the packing as shown in Fig. 4.

57,855.—Metallic Hub.—Henry B. Buch, Litiz, Pa.

I claim a metallic hub formed by the union of the pipe-box, C, with its flanged and prolonged screw pipe, D, together with the flanged nut, E e, cap, F f, all held on the pipe box, in combination with the annular disks, G G' headed bolts, H, and their nuts, h, all combined and arranged in the manner, and for the purpose specified.

57,856.—Cultivator.—M. H. Bucknall, Darien. Wis.

First, I claim the lever frames, B B, attached at their front ends by joints, a a, to the front end of the frame, A, in combination with the segment guides, C C, and the stop pins, d, or their equivalents, substantially as and for the purpose herein set forth.

Second, The combination of the teeth, J, standards, I, rivets o, shoulders, k, screw nut, l, braces, m, and frame, A, substantially as described for the purpose specified.

57,857.—Lock.—R. B. Burchell, Brooklyn, N. Y.

I claim the reversible tumblers set and turning upon a stud that is upon the central line or plane of the bolt and key stud, the ends of said tumblers projecting beyond and entering notches at the inner side of the bolt head when the bolt is retracted, substantially as set forth.

57,858.—Cultivator.—John Burnham and William C. Lathrop, La Salle, Ill.

First, We claim the attaching of the plow frames, G, to an upright mounted frame, A, by means of joints, d, and bars, F, arranged as shown, to form a universal joint connection to admit of the vertical and lateral movement of the plows, substantially as described.

Second, We also claim the connecting of the two plow frames, G G, by means of a yoke H', having its ends pivoted to bars, I' I', which are secured horizontally on the frames, G G, by pivots, e, to admit of the frames, G, rising and falling independently of each other, as set forth.

Third, We also claim the duplex double tree arrangement composed of the two double trees, D E, attached to the draught pole, C, and connected by the rods, a, substantially as described.

57,859.—Dredging Machine.—Thomas Byrne, New York City.

I claim the obtaining of power for the purpose of dredging or excavating channels or sand bars by means of water gates or wings attached to steam or other vessels, as herein described.

57,860.—Attaching Roofing to Buildings.—Thomas Y. Card, Cortland, N. Y.

I claim the hereinbefore-described process of constructing and covering the roof of buildings in the manner and with ingredients compounded, substantially as set forth.

57,861.—Musical Instrument.—R. W. Carpenter, Brattleboro, Vt. Antedated Sept. 2, 1866.

I claim the double-jointed pedal susceptible of a double or duplex movement in combination with the lever, e, substantially as described.

57,862.—Machine for Sowing Wheat and other Grain.—Cyrus C. Carter, Exeter, Ill.

First, I claim the shaft, Q, with the lever, R, attached, in combination with the springs, P, and runners or furrow openers, O, all arranged to operate substantially as and for the purpose set forth.

Second, The sliding or adjustable inclined board, K, with the seed-conveying tubes, M, attached, and arranged in relation with the seed box, E, substantially as and for the purpose specified.

Third, The pendants or agitators, J, attached to the rock shaft, I, operated from one of the wheels, C, as shown, in combination with the perforated bottom, a, of the seed box, E, and the perforated slides, c G, substantially as and for the purpose set forth.

57,863.—Barrel or Cask.—Chas. H. Carver, Taunton, Mass.

I claim the combination as well as the arrangement of the screw or faucet receiving block, C, with the metallic vessel, B, or the same and the barrel encompassing such vessel.

I also claim the combination as well as the arrangement of the rubber washers, or their equivalents, and the metallic washer with the block, C, and the vessel, B, or the same and the barrel, A, the said washers being to form with the head of the vessel, B, and with a faucet, as described, a tight joint at the ajutage of the vessel, B.

I also claim the improved manufacture of barrels as made of the wooden barrel, A, and the lining vessel, B, made of tinned or plate iron, as specified, arranged together as set forth.

57,864.—Revolving Fire-arm.—Albert Christ, California, Ohio.

First, I claim the combination of the two circles of cartridge chamber, I, two feed fingers, N N', and single hammer, M, constructed, arranged, and operating as and for the purposes set forth.

Second, Propelling a revolving breech by means of one or more fingers, N, adapted to operate on the heads of the metallic cartridges, in the manner explained.

57,865.—Knife Cleaner.—Wm. Christian and J. H. Marrow, New York City.

First, We claim the employment, in connection with the box, of the two yielding boards, D and E, the upper board, D, having formed in it the supply hopper, B, and the whole arranged to operate substantially as set forth.

Second, The employment, in combination with the cleaning mechanism, of a waste drawer, B, and fork platform or rest, f, the whole arranged to operate substantially as set forth.

Third, The employment, in connection with the case, of holding devices, I K, as specified for the purpose set forth.

57,866.—Lamp for Petroleum.—M. C. C. Church, Parkersburgh, West Va., and Edward H. Knight, Washington, D. C.

We claim a tank for the transportation or storage of petroleum or other liquids, provided with an auxiliary chamber and connecting pipe, operating substantially as described.

57,867.—Whiffletree.—Frank Clemens, Lafayette, Ind.

I claim the crank shaft, C, springs, G G, and pins, F F, in combination with straps, I I, and whiffletree, B, for the purposes and substantially as described.

57,868.—Hand Corn Planter.—Rienzi L. Cleveland, Durand, Ill.

First, I claim the combination of the lid, L, with the box, A, and brush head, N, substantially as set forth.

Second, The slide, o, in combination with the chamber, D, and stationary bottom, C, and brush, G, as and for the purpose set forth.

57,869.—Apparatus for Stripping Files.—T. Coldwell, Matteawan, N. Y.

First, I claim the reciprocating, sliding, stripping tool, I, arranged and operating with holders, N2, substantially as described for the purpose specified.

Second, In combination with the above, I also claim the frame or guide way, H H, for the stripping tool, hung so as to allow the said tool to be lifted from the file blank or blanks upon which it is operated without arresting its movement, substantially as and for the purpose specified.

Third, The holders, N2, for the file blanks, having sliding adjustable clutches, K, at each end, for securing the blanks in place for the same, substantially as and for the purposes specified.

Fourth, Swiveling the blank holders, N2, to the frame, M, supported upon spiral springs, N, or their equivalents, at each end, as and for the purpose described.

57,870.—Compound Projectile.—John E. Crane and Jesse Fox, Lowell, Mass. Antedated Sept. 5, 1866.

We claim constructing shells and shot, for ordnance, substantially in the manner and upon the principle herein set forth, for the purpose of increasing the fragments from shells, and avoiding the shrink at the center of shot, as specified.

57,871.—Garden Plow.—John M. Crawford, New Castle, Ky.

I claim the garden plow or cultivator, consisting of the slotted beam, A B H I, fore and hind wheels, J and K, fastening, G or P, scrapers, L M, guiding and propelling handle, N, and interchangeable shares or cultivating instruments, substantially as set forth.

57,872.—Fence.—Samuel Crocker, Oakland, Iowa.

First, I claim the combination and arrangement of the stakes or braces, C, and binding bar, D, with the overlapped ends of the adjacent panels, A and B, substantially as herein described and for the purpose set forth.

Second, Securing the ends of the adjacent panels, B and E, at the corner or angle of the fence to each other by combining the projecting ends of the boards, b', of the panel, B, the end uprights, e', of the panel, E, and the keys or wedges, F, with each other, substantially as herein described and for the purpose set forth.

57,873.—Machine for Pointing Wires.—C. O. Crosby, New Haven, Conn.

I claim a device for holding and rotating the wire, rod, or similar article, in combination with compressing dies or hammers, when the holding device is constructed to operate so as to avoid injury to the said wire, rod, or article being drawn by twisting, substantially as herein set forth.

57,874.—Composition for Roofing.—Cary K. and S. F. Daniel, Covington, Ky.

We claim the composition, herein described, composed and compounded, as described for the purposes stated.

57,875.—Spring Bed Bottom.—John and Samuel Danner, Canton, Ohio.

We claim supporting the longitudinal slats upon spring bearers or cross pieces, and holding them thereto so that they may move endwise thereon by means of the staples, long slots, and cord or twine, or their substantial equivalents, as herein described and represented.

57,876.—Clutch Hook for Slaughtering Purposes.—Samuel Davis and Windsor Leland, Chicago, Ill.

First, We claim the combination of the hooks, A and C, provided with the eyes or rings, a c, respectively, and the chain, B, operating substantially as specified and for the purposes set forth.

Second, We claim the combination of the above-described device with an inclined rod or track, F, so arranged upon its supports as to allow the hook, A, to slide upon the same, substantially as and for the purposes described.

Third, We claim the combination and arrangement of the catching device, A B C, the inclined rod, F, and hook and chain, H I, operating substantially as herein described and for the purposes specified.

57,877.—Tackle for Raising and Lowering Boats.—William A. Devon, Port Richmond, N. Y.

I claim the method herein described of raising and lowering ship's boats, by running the ropes of the end tackle through a block connected with an intermediate or center davit, and afterward giving the loose ends or portions of said ropes bite on or attaching them to a rotating barrel, substantially as specified.

57,878.—Wheel Plow.—O. P. Dills, Falmouth, Ky.

I claim the slotted adjustable bars, C F, with wheels, D E, attached and the brace rod, K, provided with the loop or eye, k, all arranged and applied to a plow, substantially in the manner as and for the purpose set forth.

57,879.—Throttle-valve Lever.—Edson Doe, Newbury, Vt.

I claim the handle, D, formed with a threaded extremity and employed in connection with the throttle lever, substantially as and for the purpose herein specified.

57,880.—Wick Burner for Heating and Cooking.—H. W. Dopp, Buffalo, N. Y.

First, I claim the application of a current of steam or water vapor, in combination with a wick burner, for burning any inflammable oil, for cooking and heating purposes, substantially in the manner herein described.

Second, I claim the mode of raising and lowering the wick, as described.

Third, I claim the employment of cylinder, M, in combination with a stove for cooking or heating purposes, and wick burner or burners, so constructed that the same shall serve to create a draft sufficient to supply the flame with atmosphere, and at the same time conduct the heat directly to the cooking utensils used, as set forth.

Fourth, I claim constructing the cylinder, M, so as to prevent the loss of heat by radiation, as shown in Fig. 2 and described.

Fifth, I claim the window, N, in combination with cylinder, M.

57,881.—Means for Raising Sunken Vessels.—Oliver Drouillard, Detroit, Mich.

First, I claim the central camel, A, Fig. 1, in combination with the lateral camels, A' A'', Figs. 2 and 3, all constructed, arranged, and to operate in the mode and for the purposes above described and set forth.

Second, The air boxes, L L', Figs. 1 2 and 3, in combination with the central and lateral camels, all constructed, arranged, and to operate in the mode and for the purposes above described and set forth.

Third, The bridle, H, Figs. 1 4 and 5, having its attached chain stops, G'' G''', constructed, arranged, and to operate in the mode and for the purposes above described and set forth.

Fourth, The bridle, H, having its attached chain stops, G'' G''', in combination with the central camel, all constructed, arranged, and to operate in the mode and for the purposes above described and set forth.

Fifth, The bridle, H, having its attached chain stops, G'' G''', in combination with the air boxes, L L', all constructed, arranged, and to operate in the mode and for the purposes above described and set forth.

57,882.—Side Gear for Thrashing Machines, etc.—Charles F. Du Vall, Milwaukee, Wis.

I claim bed plate, B, traversing plate, C, shafts, E and F, pillow block, D, and set screws, H H, or their equivalents, combined and arranged substantially as and for the purpose described.

57,883.—Sugar-cane Mill.—Alvah Eaton, Madison, Wis.

First, I claim the employment or use, in a cane-crushing mill, of a jointed frame or a frame hinged at one end, in connection with a roller having its bearings on arms one end of which rests on the frame, and all arranged in such a manner that the gravity of the mill is rendered subservient in assisting in giving the necessary pressure to the rollers, substantially as set forth.

Second, The rock shaft, J, provided with the arms, L L, or their equivalents, and the projections, m m, in connection with the links, n n, attached to the frame, substantially as and for the purpose specified.

Third, The adjustable boxes, G, in which the rollers, h, of the arms, E, are fitted, for the purpose of virtually lengthening and shortening said arms, as specified.

Fourth, The lips, k, at the outer surfaces of the side pieces, A A, in connection with the lips, l, at the upper ends of the uprights, I I, as and for the purpose set forth.

57,884.—Medical Compound.—Joel B. Edwards, Knightstown, Ind.

I claim the combination of the within named ingredients to form an antiseptic compound for the purpose described, substantially as set forth.

78,885.—Fruit Drier.—Wm. L. Fisher and Wm. Holly, Freeport, Ill.

First, We claim the double flue, H K, in combination with the furnace and with the drying chamber of a fruit drier, substantially as described and for the purpose set forth.

Second, The fruit tray, formed of lath, B, and canvas, C, in combination with the furnace and drying chamber of the fruit drier, substantially as described and for the purpose set forth.

57,886.—Device for Carrying Hose.—Peter Frentz, New Albany, Ind.

I claim the pivoted handles, A A, with bands, B B, chains, D D, plate, E, and eccentric hook, H, arranged in the manner substantially as and for the purposes herein set forth.

57,887.—Bow Pin for Ox Yokes.—E. G. Gale, Holland, Mich.

I claim securing the bows of an ox yoke in and to the yoke by means of toothed rack or ratchet bolts, in combination with toothed sectors engaged with such bolts, when arranged together and upon the yoke, substantially as described.

57,888.—Corn Husker.—James H. Gano, Tremont, Ohio.

I claim a corn husker having upon it the rings, a b, curved or swelled portion, c, and projection, d, and worn upon the fingers, as and for the purpose herein set forth.

57,889.—Sulky Plow.—Roland R. Gaskill, Mendota, Ill.

First, I claim a sulky plow having the driver's seat, K, so attached as to permit it to oscillate freely horizontally, substantially as and for the purposes set forth.

Second, The hereinbefore described mechanism for adjustably suspending the plow, A, by a system of levers, C E and F, and a chain, F', said several parts being respectively constructed and the whole combined substantially as set forth.

57,890.—Manufacture of Fuel.—Samuel D. Gilson, Oswego Falls, N. Y.

I claim the new article of manufacture herein described, constituting fuel made from peat, or peat and other substances combined, in hollow or serrated triangular form, essentially as specified.

57,891.—Yeast-cake Drier.—Cyrenius Gleason, Buffalo, N. Y.

First, I claim the lattice-work frame, when constructed as and for the purpose herein substantially set forth.

Second, In combination therewith, I claim the removable pieces marked B, as and for the purposes described.

57,892.—Furnace for Calcining Gypsum.—Freeman Godfrey, Grand Rapids, Mich.

First, I claim, in an apparatus for calcining gypsum, one, two, or more rotary boilers, substantially as and for the purpose specified.

Second, I claim a distributor, B2, arranged and operating substantially as described.

Third, I claim a spiral conveyor, b', located within the heater, and operating substantially as described.

Fourth, I claim a cooler, G, constructed, arranged, and operating substantially as described.

Fifth, I claim the combination and arrangement of the fire arch, A, heaters B B', rings or collars, a, friction rollers, g, spiders, e, and driving shafts, D D, as and for the purpose specified.

57,893.—Machine for Cutting Standing Corn Stalks.—J. M. Goff, Ionia, Ill.

I claim the knife or cutter cylinder, B, connected to the draft pole, A, substantially as shown and described, in combination with the pivoted frame, C, provided with the wheels, D D, and with or without the hooks, G G, all being arranged to operate substantially as and for the purpose set forth.

57,894.—Apparatus for Making Vinegar.—Theodore Grundmann, St. Anthony, Minn.

I claim the arrangement of a series of troughs or channels, C C' C'', etc., provided with covers, through which the liquid to be acidified, and also a sufficient quantity of air to produce acidification, is admitted, substantially as and for the purpose described.

57,895.—Carpet Fastener.—Christopher Gullmann, Poughkeepsie, N. Y.

I claim holding the toothed rod, A, against the carpet and floor by means of the screw, v, having a curved neck, b, substantially as described for the purpose specified.

57,896.—Manufacture of Spectacle Frames.—Henry Hammond, Hartford, Conn.

First, I claim the method herein described and shown of forming spectacle fronts in one piece out of sheet metal.

Second, The stud, d, on the end, A, serving as a pivot for the temple, and through which the screw passes to fasten the ends, A, one to the other.

57,897.—Pump.—A. S. Hanson, Milan, Mich.

I claim the combination with the main cylinder or stalk, A, of the pump, divided into two chambers, C and D, of the cylinders, E and L, respectively, having valves, F and G and M, and N, and pistons, H and O, connected to a common handle, K, when all arranged together and operating substantially in the manner described and for the purpose specified.

58,898.—Loom for Weaving Slatted Window Shades.—George Hasecoster, Richmond, Ind.

I claim the slat trough, 5, and slat rest, 6, in combination with the slat carrier, 1, all arranged and operating as and for the purposes set forth and described.

Second, The cord, 7, spring, 16, slide, 11, and top, 12, when so arranged and operating as to carry and deliver the slats within the shed, in combination with the slat carrier, 1, substantially as set forth.

Third, The combination of the pulley, 8, cord, 7, and sliding clutch, L', when operated as and for the purposes set forth.

Fourth, The shaft, i, pinion, E, drum, U, and arms, Z and R', arranged as and for the purposes set forth.

Fifth, The combination of the star wheel, T, levers, W W, connections, V V', and treadles, t t, as set forth and described.

Sixth, The shaft, d', and its curved bearings, d d d, constructed and operating as herein set forth and described.

Seventh, The combination of the batten, a a, reed, c, and shaft, d', with its curved bearings, d d d, when arranged and operating as and for the purposes set forth.

Eighth, The friction straps, l l, and slides, m m, in combination with the warp cylinder, R, as set forth and described.

Ninth, The combination of the arm, z, lever, Z, levers, P and P', and ratchet wheel, O, all arranged and operating as and for the purposes set forth.

57,899.—Hame Tug and Buckle.—Lawrence W. Heeland, Petersburg, Ill.

First, I claim the tug, A, when constructed with the necking, a', hook, a, and mortise, a2 a3 and a4, substantially as described.

Second, I claim the buckle, C, and its spring, c3, when constructed and employed substantially as herein described and set forth.

Third, I claim the combination of the tug, A, and the buckle, C, for the purpose of attaching the trace of a harness to the hame thereof, substantially as herein described and set forth.

57,900.—Cooler for Bees, etc.—John Herget, St. Louis, Mo.

First, I claim the combination and arrangement of the chambers, A B C, and the sub-vault, A2, substantially as herein described and set forth.

Second, I claim the basin, D, when constructed with a perforated bottom, and otherwise so arranged as to discharge its contents either in a shower of drops or a number of very small streams down into the cooling chamber, B.

Third, I claim the cooling tubes, B, when employed as herein described and set forth.

Fourth, I claim the construction and arrangement of the pipes, E and E', as herein described and set forth.

57,901.—Paddle Wheel.—Adolph Heuston, San Francisco, Cal.

What I claim as my invention is the combination of the paddle, A, the pivots, B'' B'', and hooks, C'' C'', with the stop, E, and lever, F, the regulator, I, all substantially as and for the purpose specified.

57,902.—Spring Dirk Knife.—Charles Hibbard, Chicago, Ill.

First, I claim the catch bar, D D, having catches, c c', on its ends, in combination with the blade, B, and spiral spring, C, substantially as described.

Second, The pin, g, in combination with the blade, B, and spring, C, substantially as and for the purpose specified.

57,903.—Molder's Flask.—James G. Holliday, Wheeling, West Va.

First, I claim the combination with the frames, A A', of the metallic hooks, E e, when formed with the studs or projections, e', and employed in connection with the keys, F, and plates, G, to connect together the several parts of said frames, substantially as described.

Second, I claim coupling or connecting together the two parts of the flask, by means of the plates, H H and 1, and tongue, J, when said plates, H H, and tongue, J, are provided with the studs or projections, h' j', and arranged to operate as described.

57,904.—Grain Binder.—Solomon T. Holly, Rockport, Ill.

I claim the combination of the ring carrier with a frame composed of two metallic-ring frames, constructed and operating substantially as set forth.

I also claim the combination of a detachable holder for the compressing strap, with a revolving carrier, and with an instrument for operating the strap holder, so that the strap holder is operated to release the strap while it is carried by the revolving carrier, substantially as set forth.

I also claim the combination of one of the jaws of the forceps (for holding the binding material) with a slide, operating substantially as set forth.

I also claim the combination of the spool for the binding material with the driving shaft of the revolving carrier by means of a spring connection, operating substantially as set forth.

I also claim the combination of the spool of the binding material with an eye guide having the form of a coil.

I also claim the combination of the pulley guide of the binding material with a movable arm, and with a fastening therefor, operating substantially as set forth.

I also claim the combination of the pulley guide of the binding material with a curved tongue casing, operating substantially as set forth.

I also claim the combination of the movable driver for the binding material with a detachable fastening to hold the driver in position, for supporting the binding material, substantially as set forth.

I also claim the combination in a binder, of the following instrumentalities, viz: the revolving carrier and a band-securing instrument secured to it, so that the latter is caused to travel round the gavel, substantially as set forth.

I also claim the combination in a binder, of the following instrumentalities, viz: the traveling band-securing instrument, and a yielding pressure holder operating upon the extremities of the band, substantially as set forth.

I also claim the combination of the stock of the movable shield plate and guard (or of either of them) with the traveling band-securing instrument, by means of a locking mechanism, so that the stock and band-securing instrument are connected and moved together, substantially as set forth.

I also claim the combination of the traveling band-securing instrument with movable nippers, operating substantially as set forth, to hold the extremities of the band.

I also claim the construction of the tying bill with lips flaring at its hinder side, substantially as set forth.

I also claim the combination of the tying bill with two sets of actuating mechanism, the first to turn it forward and the second to turn it backward, substantially as set forth.

57,905.—Pole and Post Puller.—Ira Holmes, South New Berlin, N. Y.

I claim an improved self-adjusting pole and post puller, formed by combining the hook, C, constructed as described, with the lever, B, and standards, A, substantially as and for the purpose set forth.

57,906.—Cultivator.—Henry Hoover, Hemlo, Ill.

First, I claim the arrangement and combination of the central beam, O, shovel standard, D', shovel, Q', with the central roller, F, and shaft, 5, when constructed substantially as and for the purpose specified.

Second, The segment guides, J, having the grooves, S, in combination with the inner beams, G, rollers and shovel standards, D'', shovels, A'', cams, L, and shaft, 5, substantially as described and set forth.

57,907.—Founders' Cleansing Mill.—Stephen D. Horton, Peekskill, N. Y.

I claim an improved cleaning mill, the body of the staves of which are slotted with rectangular hopper-shaped slots or holes, substantially as described, and for the purpose set forth.

57,908.—Machine for Molding and Shaping Dough into Loaves or Crackers.—William Hotine, Brooklyn, N. Y.

First, I claim, in combination with a grooved cylinder and shell, the use of nipples or molding points of any suitable form, set in the grooves, for the purpose as described.

Second, I claim the combination of the roller, D, with the shell, E, made and arranged in the manner and for the purpose, as described.

Third, I claim, in combination with a grooved cylinder and shell, the use of the revolving cups, F F and H H, or their equivalents, for the purpose of placing and discharging the pellets, as described.

Fourth, I claim the use of flatting plates, G G, in combination with a molding apparatus, such as herein s t forth, whereby the pellets are received direct from the molder, for the purpose as herein described.

Fifth, I claim, in combination with an apparatus for molding and shaping crackers, etc., the forked or serrated sliding bar, I, by which the cakes are brought up in an even line on the table, for the operation of the docker.

57,909.—Plow.—Chester B. Hunting, Clinton, Ill.

A cutter in the form of a disk, and attached to a plow, so as to cut from bottom to top, for the purposes and substantially as herein described.

57,910.—Faucet.—George R. Huntley, Taunton, Mass.

First, The screw clamp, E, and trunnions, F, in combination

with the nozzle, D, for the purpose and substantially as described.

Second, The faucet, A, in combination with the adjustable nozzle, D, and screw clamp, E, all for the purpose and substantially as described.

57,911.—Spike Drawer.—S. Hurt and J. Douglass, Prentice, Ill.

We claim constructing a claw bar or spike drawer of two parts connected together by a joint, in such manner that the implement may be used either in an extended position or with one part at an angle with the other, substantially as and for the purpose specified.

57,912.—Sounding Board for Piano.—A. De Kuhn, New York City.

I claim a sounding board, made in box form, detached from the sides of the case, substantially as described and for the purpose set forth.

57,913.—Churn.—B. Illingworth, Freeport, Ill.

I claim the arms, B B, provided with the buckets, D D, constructed as described, upon the shaft, C, when arranged within the churn, B or A, and operating in the manner substantially as and for the purposes specified.

57,914.—Lantern.—John H. Irwin, Chicago, Ill.

I claim hinging the guard of a lantern to the bottom casing thereof, and securing the parts together opposite the hinge by means of a catch, or its equivalent, substantially as herein specified and shown.

57,915.—Retort for Generating Gas.—John H. Irwin, Chicago, Ill.

First, I claim providing a retort for generating gas and refining petroleum, arranged as described, with an air vent or tube, substantially as and for the purposes specified.

Second, In combination with a retort of the described arrangement and construction, I claim the employment of a reservoir, A, and connecting pipe, a, arranged and operating as and for the purpose described.

Third, I claim the combination and arrangement of the reservoir, A, connecting pipe, a, retort, B, provided with an air vent, as described, pipe, c, and receiver, E, substantially as and for the purposes set forth.

Fourth, In combination with a retort, B, I claim the employment of the auxiliary vapor pipe and burners, d, arranged and operating substantially as shown and described.

57,916.—Piston Packing.—A. W. Jackson, Centralia, Ill.

I claim the combination and arrangement of the perforated plate, C, perforated plate, B, having projections, b', valve ring, E, grooved ring, F, ring, G, and projecting plate, H, constructed and operating substantially as and for the purpose set forth.

57,917.—Belt Guide.—Lewis R. Jenkins, Philadelphia, Pa.

I claim the adjustable hangers, A and A', with their adjustable frames, B and B', and pulleys, C C', the whole being constructed and arranged substantially as described for the purpose specified.

57,918.—Combined Knife and Fork.—John S. Jennings, Buffalo, N. Y.

First, I claim a combined one-handed knife and fork, consisting of the blade, H, pivoted to the sleeve, F, with spring, o, or its equivalent, and finger lever, I k, in combination with a fork, operating substantially as set forth.

Second, I also claim, in combination with the above-described parts, the thumb bearing or socket, L, operating in the manner and for the purposes described.

57,919.—Brick Machine.—John Jones, Baltimore, Md.

First, I claim the combination of the shoulder, P, and large teeth, Q, to overcome the inertia, and the small teeth, R, and the entire arrangement by which the bed-plate, J, receives its alternate motion.

Second, The vertical slides, U and f, in connection with the movable bottom of the molds, whether the slides are acted on by cam, eccentric, or lever, for the purpose of giving a perpendicular pressure to the brick, or raising the bricks when pressed perfectly perpendicular from the mold.

Third, The entire arrangement, as described, in the specifications for clearing bricks to the off-borer, and also for the oiling apparatus.

Fourth, The arrangement by which the off-bearer receives its alternate motion and communicates the same to the bricks, as described.

Fifth, The application of this machine for pressing clay, peat, or any other substance capable of being molded under pressure.

57,920.—Valve for Water Pipes.—William Kearney, Belleville, N. J.

I claim the combination and arrangement of the valve, C, box, A, flanges, B B, cock, b, screw, D, worm wheel, H, and screw I, all arranged to operate substantially in the manner as and for the purpose specified.

57,921.—Scale Beam.—Joel F. Keeler, Pittsburgh, Pa.

I claim constructing scale beams and their appendages so as to show both the larger and the smaller denominations of the net and of the tare weighed, substantially as described.

Second, I claim constructing scale beams so that two or more poises may be made to pass each other along the same beam usually its entire length, substantially in the manner described.

Third, I claim dividing the counter weight holder, d', into sections, when two or more of said sections are marked or figured, substantially as described and for the purposes set forth.

57,922.—Washing Machine.—G. H. Kidney, Cleveland, Ohio.

I claim the adjustable racks, H I, button, b, in combination with the pressure boards, F, springs, K, and beaters, as and for the purpose specified.

57,923.—Evaporator.—David Kinzer, Sardinia, Ohio.

First, I claim the marginal ledge, C D, formed upon or adapted to be attached to the common hemispherical boiling kettle.

Second, The kettle, A B C D, or its equivalent, as a new article of manufacture.

57,924.—Bee Hive.—E. N. Kingsley, Minneapolis, Minn.

First, I claim the case, A, constructed with doors or slides, E E, notched at their lower edges, and having notched slides, F, in front of them, for the purpose of closing the bee entrances or wholly or partially opening them, as may be desired.

Second, The passage, a, in the rear of the case between its wall and the frames, opening into the excavation, D, for running off the moisture from the boxes and supplying warm air to the case, substantially as described for the purpose specified.

Third, The securing and arranging of the top and bottoms, h, in the boxes or sections, H, so that a space will be allowed all around them for ventilation and the evaporation of moisture, substantially as described.

57,925.—Method of Starting Street Cars.—T. F. Kums and W. W. Benson, Rockford, Ill.

First, We claim the combination and arrangement of lever, D, crank, E, thrust bar, F, pawl, I, ratchet, H, and tie piece, J, or their equivalents, operating substantially as described and for the purpose set forth.

Second, The combination and arrangement of the lever, D, with spring, K, and stud, X, or their equivalents, substantially as described.

57,926.—Head Rest for Railway Cars.—Peter A. La France and J. D. Dinsmore, Elmira, N. Y.

First, We claim a portable head rest constructed with adjustable jaws, A A', supporting a curved head rest, C, said parts being respectively constructed and combined for use, substantially as set forth.

Second, We claim the semicircular head rest, C, when constructed with slots for receiving a stud, B, by which it is adjustably attached to the jaws, A A', substantially as set forth.

Third, We claim the pad, E, suspended upon elastic straps, E', when used in combination with a head rest, substantially in the manner and for the purpose set forth.

Fourth, A portable head rest for attachment to the backs or arms of the seats of railway cars, when so constructed that the jaws by which it is so attached shall form, the front piece an obtuse, and the hind one an acute angle, with the top face to which the head rest is attached, substantially as set forth.

57,927.—Extension Table.—George Lanter and Jacob Kautz, Vincennes, Ind.

First, We claim the application of the half legs, B B, to a longitudinally and laterally extensible frame of an extensible table, substantially as described.

Second, Connecting the outer ends of the sliding rail sections d d, together by means of jointed cross pieces, e e, substantially as described.

57,928.—Dumb Waiter.—R. Walcot Lawrence, New York City.

I claim the brake cord, S, applied in combination with the pulleys, T, on the adjustable cross bar, U, and the pulley, R, on the shaft, Q, substantially as described for the purpose specified.

57,929.—Water-gage Float.—L. L. Lee, Milwaukee, Wis.

I claim a float hammer, hardened in the manner and for the purpose substantially as described.

57,930.—Knob Latch.—Robert Lee, Cincinnati, Ohio. Antedated Sept. 2, 1866.

I claim, First, The reversible latch, C D d d', detachable slide, E F f f', shiftable pin, G g g' g'', and spring, H, or their equivalents, arranged and operating as set forth.

Second, combining with the above elements the auxiliary spring, H', and shallow depressions, g''' d'' d''', for the purpose stated.

Third, In the described combination, the indexed and reversible pin, G a g g' g'', and the cap, B, having the hole, b, and numerals, 1 2 3, or devices substantially equivalent.

57,931.—Car Coupling.—David Lippy, Mansfield, Ohio.

I claim a car coupling composed of a swinging or pendent draw pin, B or B', fitted in a draw head, A or A', in combination with fixed rods, G G, and a shaft extending down in front of the draw head and connected either with the draw pin or with a sliding ledge, I, in the draw head, and all arranged in such a manner that the link or shackle, C, may, when a car is thrown from the track, be liberated by the movement of the shaft acted upon by the rods, G G, substantially as shown and described.

57,932.—Condenser.—J. Fred Llewellyn, Louisville, Ky.

I claim a condensing apparatus for use by druggists and others in separating alcohol and other volatile liquids, constructed and operated substantially as above set forth.

57,933.—Elastic Bulb Syringe.—Hamilton D. Lockwood, Charlestown, Mass.

I claim the combination of the neck, c, button, d, and flange, e, for securing the elastic bulb, or the tube, to the metal connector, substantially as set forth.

57,934.—Gage for Screw-cutting Tools.—Edward Lyman, New Haven, Ct.

I claim a gage combining within itself a guide for forming the cutter with guides for setting the cutter, substantially in the manner and for the purpose herein set forth.

57,935.—Well Tube.—Francis A. Mack, Niles, Mich.

I claim forming the induction openings of iron well tubes of oblique incisions, e e, formed by cutting from the inside of the tube, having protruding lips or edges, with alternating depressions to prevent the admission of sand or other solid particles within, substantially as set forth.

57,936.—Method of Receiving and Delivering Mail Bags on Railway Cars.—Peter N. Maine, Olmsted Falls, Ohio.

I claim, First, the adjustable hook, C, pivoted to the shank and spring, c', in combination with spring hook, L, the shaft, B, weighted arm, D, hook, F, and staple, I', as and for the purpose set forth.

Second, The shaft, B, in combination with the arm, O, frame, A, lever, G, and staple, I, arranged as and for the purpose set forth.

57,937.—Tree Protector.—D. P. Mathews, Winthrop, Mass.

I claim my improved tree protector, made as described, viz: of the tubes, A B, and the two conic frusta, B C, arranged and applied, with respect to each other, as specified.

57,938.—Flyers for Roving Frames.—Thomas Mayor, Pawtucket, R. I.

I claim forming upon the shoulder of the presser to a flyer an inclined plane, a, and combining the same with a stud pin, b, or other fixed stop in the side of the flyer, substantially as described for the purposes specified.

57,939.—Ground Drag.—B. J. McAfee, and J. H. Wirt, Delphi, Ind.

We claim the sides, A, in combination with the cross bars, B, when constructed and arranged, in relation to each other, in the manner and for the purpose set forth.

57,940.—Apparatus for Carbureting Air.—H. M. McAvoy, Baltimore, Md.

I claim, First, The air-forcing wheel, B, and the attached cylindrical casing of perforated metal or frame, covered with fibrous or porous material, arranged and operating substantially as described.

Second, I claim one or more meter wheels, C, covered by permeable casing, C', revolving independently by the pressure of the gas from the forcing wheel, being separated from the chamber, B'', by the partition, D, and connected therewith by pipe, E, substantially as described.

Third, I claim the feeding apparatus, H, operating as described, and connected to any part of the machine, in combination with the partitions, G G, and shelf or gutter, I, substantially as described.

Fourth, I claim the regulator chamber, J, and its inverted vessel, L, as described, in combination with the connecting pipes, K K F F and E' E''.

Fifth, I claim the casing or box, M, arranged on the outside of the machine for containing the gearing, substantially as described.

Sixth, I claim the perforated metal or wire-gauze diaphragms in the air inlet, for the purpose described.

57,941.—Governor for Horse-power.—Thomas B. McConaughey, Newark, Del.

I claim the governor herein described, the same consisting of the ball arms, F, hung on a common center pin, a, of the governor shaft, provided with arms, I, connected together with spring, J, in combination with swinging arms, L, of the fixed collar, K, of the governor shaft and loose collar, M, when combined and arranged together and connected with the governor shaft so as to operate substantially in the manner described and for the purpose specified.

57,942.—Churn.—Wm. R. McCutcheon, Washington, Iowa.

I claim, First, The arrangement of the shafts and dashers herein set forth, whereby the one or the other dasher may be operated as required.

Second, The arrangement of the dasher, p, in the oblique position in relation to the dasher, o, as herein recited.

Third, The arrangement of the spaces or holes, v and w, in the dashers, as and for the purposes described.

57,943.—Railroad Chair.—B. McDevitt, Belvidere, Ill.

I claim the combination of the chair, made in two parts or sections, B and C, and the wedge, G, when constructed, combined, and arranged together substantially as and for the purpose described.

57,944.—Hames Tug.—John McInnes, Waverly, Illinois.

I claim the combination of the metallic plates, C and D, also the link, E, with the tug, A, and trace, B, substantially as described.

57,945.—Cotton-tie Fastening.—Thomas McIntire, Portsmouth, Ohio.

I claim a new article of manufacture, viz: iron hoops for cotton bales, cut to the required length, and having a clasp or buckle, constructed substantially as described, permanently attached by a rivet at one end so as to form a hinged joint, the whole being covered by a protecting covering of paint or varnish, substantially as described.

57,946.—Farm Gate.—Horace D. Mead, Wayne, N. Y.

First, I claim the weights, G and G', when applied as and for the purpose specified.

Second, I claim the arrangement of the supports, F, when made and applied substantially as set forth.

57,947.—Apparatus for Packing Straw into Boilers.—Harrison B. Meech, Fort Edward, N. Y.

First, I claim the plunger, a, and shaft, G, in combination with the cylinder, E, and boiler, A, substantially as described.

Second, The cylinder, E, and diaphragm, d d, substantially as and for the purpose specified.

Third, The combination of the frame, o o and F, reciprocating bar, H H, shaft, G, cylinder, E, diaphragm, d d, with the boiler, A, substantially as and for the purpose specified.

57,948.—Battle Valve.—Warren P. Miller, San Francisco, Cal.

I claim the valve, c, when made to operate in the case, b, by means of the weight, g, substantially as shown and described.

57,949.—Aerial Railroads.—Richard Montgomery, New York City.

First, I claim the construction of an aerial railroad with two tracks, one above the other, substantially as described.

Second, The construction of the horizontal portion or cross-ties of an aerial railroad in the form of a double curve, substantially as shown in fig. 2, plate II., and in the manner herein described.

Third, The construction of an aerial railroad upon a single column, substantially as shown in fig. 3, plate II., and in the manner herein described.

57,950.—Ladies' Dress Elevator.—S. A. Moody, New York City.

I claim the arrangement of the key or toggle, b, affixed to the dress by a short cord, substantially as described, and a series of rings, c, for looping up the skirts of ladies' dresses, as and for the purposes herein described.

57,951.—Sled Brake.—H. L. Naramore, Cummington, Mass.

I claim the levers, L L, rods, J J, and elbow levers, I I, in combination with the brake bars, H H, and sled, A, substantially as and for the purposes described.

57,952.—Cultivator Plow.—W. D. Nichols, Chicago, Ill.

First, I claim connecting the mold boards or plows, A A, with a hinge joint, substantially as described.

Second, The slot, s, or its equivalent, in combination with the mold boards or plows, substantially as described.

57,953.—Steam-engine Governor.—William Nichols, Elmira, N. Y.

I claim the arrangement, substantially as described, of the balls, D, arms, D' cams, D'', and weight, E, for the purpose set forth.

57,954.—Evaporator.—Robert C. Nourse, Corydon, Ind.

First, I claim the stirrers, B, arranged in two rows, and applied to a common rod, C, connected by an arm to a crank shaft, substantially as and for the purpose set forth.

Second, The skimmers, F, operated from the crank shaft, E, in connection with the inclined planes, H, all arranged and applied to an evaporating pan, substantially as and for the purpose specified.

Third, The combination of the stirrers and skimmers, applied to an evaporating pan, to operate in the manner substantially as and for the purpose set forth.

57,955.—Machine for Varnishing Cloth.—Samuel B. B. Nowlan, New York City.

First, I claim the steam table, C, arranged underneath the cloth and in relation with the brush, D, substantially as herein set forth, for the purpose specified.

Second, The adjustable sliding frame, G, applied in combination with the vat, B, substantially as herein set forth for the purpose specified.

Third, The vat, B, pressure rollers, J n, and frame, G, arranged in relation with each other and with the steam table, C, and brush, D, substantially as herein set forth.

Fourth, The arrangement of the blower, E, and perforated serpentine pipe, F, with reference to the cloth as it passes from the coating or saturating devices, substantially as herein set forth for the purpose specified.

57,956.—Waterproof Composition.—Samuel B. B. Nowlan, New York City.

I claim a waterproof composition, made substantially in the manner herein described.

57,957.—Vise.—Charles Parker, Meriden, Ct.

I claim the wrought-metal bar, D, in combination with the cast metal jaw, C, when constructed and united substantially in the manner and for the purpose specified.

57,958.—Mode of Treating Cane Juice.—John E. Pattison, Houma, La.

I claim the revolving cylinder, A, inclined on its axis, furnished with lifting buckets, d, and adapted to the passage of a body of gas, substantially as described.

I also claim, in combination therewith, the draught wheel, operating as described.

57,959.—Sled.—Francis Peabody, Vevay, Ind.

I claim, First, The eye bolts, J, or their mechanical equivalents, in combination with the raves, E F, transverse beams, G H, and cross bars, M N, all arranged and operating substantially as herein described and specified.

Second, In combination with the eye bolts, J, and self-adjusting frame, E F G H M N, I claim the flexible diagonal braces, T T', for the purpose specified.

Third, In combination with the elements of the two preceding clauses, I also claim the double-ended runners, A a a B b b', as described and set forth.

57,960.—Composition for Filling Wood.—James Perry, Northampton (Leeds), Mass.

First, I claim the use of silicious marl, or infusorial earth, for the purpose of filling and polishing wood, substantially as herein set forth.

Second, The combination of silicious marl with any or all of the substances herein named: sulphate of zinc, muriate or ammonia, gum arabic, gum tragacanth, oil, substantially in the manner and for the purpose herein set forth.

57,961.—Combined Harrow and Marker.—Almeron Pierce, Olmsted, Ohio.

First, I claim the toothed roller, D, and smooth roller, C, in combination with the frames, A A', as and for the purpose substantially set forth.

Second, The wheels, E E' and F, the arms, G, and curved arm,

H, as arranged, and in combination with the rollers, D and C, and the frame, A A', for the purpose and in the manner described.

57,962.—Car Coupling.—A. Pierce, Olmsted Falls, Ohio.

I claim the arrangement of the lever, C, sliding bolt, G, and spring, b, in combination with the sliding catch, c, springs, f', and bumper, E, arranged and operating as and for the purpose set forth.

57,963.—Apparatus for Drying Photographs.—Alfred C. Platt, Oberlin, Ohio.

I claim a device for holding a print or picture in a curved or convex shape while drying, substantially as described.

57,964.—Table-stand for Food.—Benjamin F. Porter, Manchester, N. H.

I claim the revolving table-stand consisting of the end plates, B B, rods, C C, gauze netting, d, shelves, F, pin, G, base, H, cross bar, I, posts, J, and catch, L, constructed and arranged in the manner and for the purpose herein specified.

Second, In combination with the above, I claim the sliding door, E, arranged and operating as herein described.

57,965.—Sheep Rack and Shed Combined.—D'Arcy Porter, Cleveland, Ohio.

I claim a sheep rack and fold, constructed substantially as and for the purpose as herein set forth.

57,966.—Screw.—T. T. Prosser, Chicago, Ill.

I claim a screw having its threads of a convex form, with a concave form of the space between them, when combined with a tapering form from the commencement of the threads to the point.

The combination of a pyramidal front with the threads of a two or three-threaded screw, when the screws and intermediate spaces are constructed substantially as set forth.

57,967.—Gate.—Stephen Puffer, Oxford, N. Y.

First, I claim two or more stationary guide supports for guiding the gate from the friction roller, and sustaining its weight when opened, substantially in the manner and for the purpose herein set forth.

Second, I claim the large friction roller, C, having its axis on either of the rear posts of a gate, and smaller friction roller, c, when arranged and combined with stationary guide supports, D D', substantially in the manner and for the purpose herein set forth.

57,968.—Plow.—Tillman Rams, Keokuk, Iowa.

I claim the share, A, provided with the socket, C, in combination with the bar secured to the landside, S, when constructed as and for the purposes and substantially as described.

57,969.—Reducing Metallic Oxides and Refining the Metal Resulting Therefrom.—Jacob Reese, Pittsburgh, Pa.

First, I claim the manufacture of iron or other metals from their ores in a furnace, in which the ore, having been fused with the aid of a blast of atmospheric air, is then reduced to its base with a hydrocarbon.

Second, The process of fusing iron ores and other metallic oxides by the aid of a blast of atmospheric air in a furnance, and the waste heat from the reducing chamber, without the use of other fuel, or with so little fuel as not to deoxidize the ore in melting, and running the melted ore immediately into a receptacle below the influence of the atmospheric blast, in which it is deoxidized by the injection of any hydrocarbon into the molten mass, in the manner substantially as hereinbefore described.

Third, The use of an atmospheric blast for fusing metallic oxides, in combination with the use of hydrogen or carbon, or a hydrocarbon, for the reduction of the melted oxide to its metallic base, substantially as hereinbefore described.

Fourth, The use of the compound of water, or steam, and oil in a liquid or vaporous condition, in the proportions hereinbefore described, as a new material for the refining of melted metal.

Fifth, Combining with a cupola, or melting furnace, one or more reducing chambers, placed, for the reception of the melted ore, below the point at which the atmospheric blast is introduced into the furnace for the purpose of running the melted ore directly from the furnace into a reducing chamber in which it may be deoxidized, carbonized and refined, away from the influence of the atmospheric blast, substantially as hereinbefore described.

Sixth, Connecting the reducing chamber or chambers to the bottom of the cupola, or melting furnace, by a hinge or pivot, so that they may be swung away from the furnace without impairing their connection with the vessel containing the reducing agent.

Seventh, The use of the hollow shaft, c, in combination with the reducing chamber, B, and connecting passage, i, for the purpose of hanging the reducer to the cupola, and allowing of the introduction into the reducing chamber of the liquid or gaseous agents for the reduction of metallic oxides.

Eighth, The combination of the water tank, E, with one or more tanks for holding the liquid, deoxidizing or carbureting agents, for the purpose of applying the pressure of live steam, or of a head of water, to forcing the deoxidizing agents into the reducing chamber, substantially as hereinbefore described.

Ninth, Constructing the tweer forming the communication between the interior of the reducing chamber and the cell below it, of fire clay or other refractory material, in combination with a tubular metallic screw stem projecting therefrom, substantially as and for the purpose hereinbefore set forth.

Tenth, The use of lime or oxide of calcium as a lining for reducers or furnaces, wherein ores or metals are decomposed or refined.

57,970.—Mariner's Compass Scale.—John Reid, Knoxville, Md.

I claim the combination of the compass and the scale, substantially as described.

I also claim, in combination with the above, the arrangement for setting compass to a given variation, for the purpose described.

I also claim in its combination with the compass and scale, the center pin, operating substantially as described.

57,971.—Caster.—John M. Riley, Newark, N. J. Antedated September 2, 1866.

I claim making caster wheels by preparing the rim, the plate and the hub in separate pieces, and uniting them to each other under pressure, substantially as above set forth.

57,972.—Self-acting Wagon Brake.—Thomas J. Rockey, McElhattan, Pa.

I claim the arrangement of the strap, h, chain g, rod, c, springs, b b, and locking devices, d e f, constructed and operating substantially as described and represented.

57,973.—Wind Wheel.—G. A. Roland, Wasioja, Minn.

First, I claim the arrangement of devices for turning the sails, consisting of the governor, M, shaft, K, hollow shaft, E, loose head, F, pin, a, oblong slot, b, ring, x, and sails, B, all substantially as and for the purpose set forth.

Second, In combination with the foregoing, the windlass, j, and rope, p, substantially as and for the purpose set forth.

Third, In combination with the wind wheel, as herein described, the turn table, L, upon rollers, R, and having a flange, f, and dogs, d, substantially as and for the purpose set forth.

57,974.—Method of Separating Sand from Water in Wells.—Timothy Rose, Cortlandville, N. Y.

I claim the combination of the inside tube with the strainer of wire cloth, or its equivalent, and the flange to cut off the inferior chamber, together with the movable point with the grooved stem, by which is secured open passage downward through the end of the main tube, substantially as herein described, and for the purpose set forth.

57,975.—Wagon Brake.—Daniel Sager, Albany, N. Y.

First, I claim the arrangement and combination of the pole, A, with the lever, F, and connections, g h, directly with the brake-bar in rear of the wheels, essentially as herein set forth.

Second, The construction, substantially as shown and described, of the pendent shoe, H, on the ends of the brake-bar, by reducing their top portions, and so that when the shoes are freely suspended, the upper extremities, S, of the lower or rubbing portions thereof will be on a level, or thereabout, with the centers of attachment of the shoes, essentially as and for the purpose herein specified.

57,976.—Machine for Cutting Belt Lacing.—Benjamin F. Sanborn, Boston, Mass.

I claim the arrangement of the bed plate, A, pressure bar, F, and standard, B, in combination with the vertical knives with inclined edges, K, substantially as described.

57,977.—Clothes Pin.—Rufus S. Sanborn, Ripon, Wis.

I claim the clothes pin constructed with an elastic band passing through apertures in the jaws and two or more times around them, and with a plate or plates inserted in the joint to prevent lateral motion, substantially as described.

57,978.—Gun Lock.—F. Schenck, San Antonio, Texas.

I claim the spring dog, j, and slide, h, in combination with the hair trigger, B, and hammer, H, constructed and operating substantially as and for the purpose described.

And I also claim the yielding tooth, a, in the main trigger to form a point d'appui for the hair trigger mechanism, substantially as herein set forth.

57,979.—Sorghum Stripper.—Daniel W. Shares, Hamden, Ct.

I claim the combination of jaws, B and C, constructed and arranged so as to operate substantially in the manner and for the purpose herein set forth.

57,980.—Machine for Forming Lock Joints in Sheet Metal.—Jacob Shaw, Hinckley, Ohio. Antedated September 2, 1866.

I claim the vibrating beam, C, die plate, F, die, E, and wedge, W, constructed and operating in relation to each other, in the manner and for purposes substantially as herein specified.

I also claim the arms, B and D, in combination with the stirrup, L, adjusting gage, P, and loop, T, substantially as and for the purposes set forth.

57,981.—Telegraphic Fire-arm.—G. W. Shawk, S. C. Morley, Cleveland, Ohio, and S. D. Cushman, New Lisbon, Ohio.

We claim the adjustable bell extension arm, H', adjustable post, K, cushion, K', in combination with lever, H, magnets and armatures, as and for the purpose set forth.

57,982.—Method of Removing Obstructions from Oil Wells.—W. C. Sherwood, Buffalo, N. Y.

I claim the method of loosening and removing or wholly destroying such obstructing tools, tubing, or other obstructions which may be lodged in artesian and other wells, by the application and use of sulphuric acid, and other equivalent acids, substantially as herein set forth.

57,983.—Combined Sheep Shed and Rack.—J. P. Sibley, Oberlin, Ohio.

I claim the combination of the shed, G I J, the hay crib, D, and grain trough, B, with each other, the said shed, crib, and trough being constructed and arranged substantially as herein described, and for the purposes set forth.

57,984.—Turning Lathes.—William Simpson, Z. Oman and S. Foreman, Nottawa, Mich.

I claim the arrangement of the tappet rod, M, with tappets, O O', by contact with which the carriage is made to operate the clutch drum on the gig-back shaft, F, substantially as and for the purpose described.

57,985.—Sheep Rack.—Err and Dwight Skeels, Springwater, N. Y.

We claim the construction of racks for feeding sheep with the sides made up of removable slats, g g, fitting in grooves, f f, of the timbers, c d, and retained in place by abutting and filling the space at the bottom, the whole operating in the manner and for the purpose specified.

We also claim the combination and arrangement of the grain troughs, o, and hinged arms, n, with the boards, k k, forming a central alley, in the manner and for the purpose herein set forth.

We also claim the special construction and arrangement of the portable sheep rack, as herein specified.

57,986.—Lock for Door of Baggage Cars.—Thomas Slaight, Newark, N. J.

I claim the combination of the timbers, j, and slide, E, provided with pin, k, and the spring arm, F, operating with the shouldered arm, d, having the thumb piece, c, substantially as described for the purpose specified.

57,987.—Axle Box for Wagons.—Alfred E. Smith, Bronxville, N. Y.

I claim the new manufacture of axle boxes for wagons and other vehicles by forming on their but-ends, a raised shoulder having a series of teeth cut therein to engage in the back end of the hub in contradistinction to the use of lugs to secure the boxes in the hub.

I also claim the making of the axle box perfectly cylindrical throughout the length of it, so that by boring the hub with a true center, the box will fit it without the necessity of cutting any grooves or channels in the hub for the purposes hereinbefore set forth.

57,988.—Lantern.—W. P. Smith, Louisville, Ky.

First, I claim two convex top pieces, B B', constructed, arranged and operating as and for the purposes set forth.

Second, In combination with the top pieces, B B', I also claim the handle consisting of the parts, J J j j, when constructed and operating as and for the purpose herein explained.

Third, In combination with the elements of the first claim, I also claim the clasp, I, for preserving the shape of the lantern either in its opened or closed condition, as described.

Fourth, I claim a folding lantern having one side made of two distinct pieces, E E', connected together by the hinge piece, e, substantially as specified.

Fifth, I claim the shiftable candle holder, I, in combination with the rod, K K, when constructed, arranged and operating substantially as specified.

57,989.—Covered Tub for Butter and Lard.—S. E. Southland, Jamestown, N. Y.

First, I claim the combination of a transverse sliding key, F, with the cover, B, and binding bar, D, of a butter tub or other vessel, substantially as herein described and for the purposes set forth.

Second, The formation of a key seat, C, in the cover, B, and binding bar, D, for the reception of the key, substantially as described.

Third, The ears, E, constructed as herein described in combination with the tub, A, binding bar, D, and cover, B, substantially as and for the purpose set forth.

57,990.—Pie Rimmer.—Jno. Stephen and William Zeller, Womelsdorf, Pa.

We claim the within described rimmer as an article of manufacture, consisting of a handle provided at one end with a rotary cutter secured to an irregular or ornamental roller and corrugated wheel, E, and at the other end with a butter cutter or print, substantially as represented.

57,991.—Plow.—A. W. Stoker, Petersburg, Ill.

First, I claim a plow having its beam, A, pivoted and adjusted upon the standard, a, as shown, and also having its rear end secured and adjusted upon the rod, b, in the manner herein set forth.

Second, In combination with the standard a, set in from the land-side as shown, I claim securing the handle, C, to the elbow iron or brace, n, when arranged as shown as described.

57,992.—Sulky Plow.—Stephen Stout, Tremont, Ill.

I claim the attaching of the draught pole, K, to the plow beam, F, by means of the universal joint, I, and flexible strap, M, in combination with the mounted frame in which the plow beam is fitted, substantially as and for the purpose specified.

I also claim the button, I, applied to the bar, C, and in relation with the handle K, of the plow, substantially as and for the purpose set forth.

I further claim the brace rod, N, applied to the plow beam, F, and to the mounted frame, substantially as and for the purpose specified.

57,993.—Steam-generator Safety Valve.—Stephen Stucky, New Albany, Ind.

I claim the valve-box, A, provided with an inner box, F, valve, C, lever, D, with weight, E, inlet, B, and throat, G, the whole being constructed and arranged in the manner substantially as and for the purpose herein set forth.

57,994.—Corn Planter and Plow Combined.—Samuel M. Swartz, Millheim, Pa.

First, I claim the arrangement of the levers, M, and their rung, N, with the plow, and with the clasp, f, and shipper, h, so that when the plows are raised up the driving mechanism will be thrown out of gear, and when let down will put itself into gear, substantially as described.

I also claim the ribs, n, and openings, o, on and through the seed slides, so that the grains can stand edgewise between the ribs and drop edgewise through the holes, as described.

I also claim in connection with the ribbed seed slides, the spring fingers, m, for arranging the grains between the ribs.

57,995.—Horse Power.—J. B. Sweetland, Pontiac, Mich.

First, I claim the two shafts, E E, situated upon opposite sides of the wheel, D, and both provided with right threads or both with left threads, as and for the purpose specified.

Second, The shafts, F F, lying under the wheel, D, both in the same direction and turning in opposite directions, as and for the purpose set forth.

Third, Providing the rim of the wheel, D, with holes as shown, as and for the purpose specified.

Fourth, The arrangement of the shafts, E E, gear wheels, G H, and shafts, F F, with the wheel, D, as constructed, as and for the purpose set forth.

57,996.—Marine Balloon.—Chester W. Sykes, Suffield, Ct.

I claim a broad, flat balloon of tubular or sectional formation to be held before the wind similar to a kite, in combination with sails and guide substantially as before described.

57,997.—Malt-kiln Floor.—George Taylor, Camden, N. J.

First, I claim constructing the plates, A, of such length as to cover two or more spaces between the joists, B, and so arranging them as to make the plates of each row break joints with the plates of the adjoining rows, to give additional strength and stiffness to the floor, substantially as described.

Second, The combination of the clips, E, with the plates, A, and joists, B, by means of the wires, F, or their equivalent, substantially as and for the purpose set forth.

Third, Confining the flanges, a, of the plate, A, together by means of bolts, rivets, or pins, to give permanency to the plates, and stiffness to the floor, substantially as specified.

57,998.—Broom Head.—J. Taylor and R. M. Lafferty, Three Rivers, Mich.

First, We claim the combination of the clamping springs, C C, and adjusting screws, c c, with the center bar, D, attached to the sheath, A, so that the ends of the screws are within the sheath, substantially as described.

Second, We claim a center bar, D, arranged with a central socket for holding the tapering end of the broom handle, substantially as described.

Third, We also claim the combination of the block, B, handle, C, passing through it, flexible sheath, A, and center bar, D, in which the handle rests, as described.

57,999.—Composition for Roofing.—J. P. Thompson, Kirkville, Iowa.

I claim a composition of matter compounded and prepared substantially as and for the purposes set forth.

58,000.—Meat Mangler.—G. H. Tift, Morrisville, Vt.

I claim the construction of the movable block, K, with key, M, and staples, I, when arranged and combined with the rollers, C, spring, D, and set screw, G, to operate as herein described and for the purposes set forth.

58,001.—Wagon Top.—Andrew R. Tully, New York City.

First, The springs, F, and their combination with the hinge, f, wagon frame, A, rear bow, E, and knobs, a, substantially as herein shown and described and for the purpose set forth.

Second, The manner of attaching the knobs, a, by riveting them to a metal strap concealed beneath the leather strap, H, substantially as shown and for the purpose specified.

58,002.—Machine for Purifying Gas.—William C. Turnbull, New York City.

I claim, First, The combination of the tank, D, pipe, C, and agitators, d and c', with the cylinder, A, perforated plates, a, and stirrers, a', for the purpose of purifying the gas, constructed and operating substantially in the manner described.

Second, The combination of the cylinder, A, with the pipe, H, boxes, I, and perforated shelves, I', for the purpose of drying the gas after its purification, substantially in the manner herein shown and described.

Third, The application of unslacked lime for the purpose of depriving the purified gas of all its hygrometrical moisture, thereby rendering the gas chemically dry, and increasing its illuminating power, substantially as herein described.

58,003.—Fence.—William Tuttle, Jr., Dowagiac, Mich.

I claim providing the adjoining ends of a panel fence with a locking device, substantially as and for the purpose described.

58,004.—Lap Joint for Belting.—Henry Underwood, New York City.

I claim, First, The combination of the strip, C, with the thinner pieces, A B, of the belting, the ends of said pieces being overlapped and secured to each other, substantially as described for the purpose specified.

Second, The manner of lacing the overlapping ends to the overlapped part of the belting, substantially as herein described and for the purposes set forth.

58,005.—Distilling Petroleum and Other Liquids.—P. H. Vander Weyde, Philadelphia, Pa. Antedated Aug. 8, 1866.

First, I claim the production of a partial vacuum by suction produced in the still by a pump, either between it and the condenser or at the end of the tube intended for the escape of the non-condensable products, which vacuum may be filled by those non-condensable products, vapor, air, or steam, led to and admitted from the other end of the apparatus, provided with a safety valve.

Second, The peculiar arrangement of the fractional condenser and its collecting and separating boxes, producing at one single operation liquids of different degrees of volatility, as above described.

Third, A series of stop cocks at different places in the still and condenser, for the purpose of admitting a current of air or of conducting the escaping gases and vapors or steam over or through the liquid during the process of exhaustion.

58,006.—Mechanical Toy.—Henry S. Vrooman, Hoboken, N. J. Antedated Sept. 2, 1866.

First, I claim an automatic animal figure, having four movable legs operated by a coil spring, in combination with a wheel or wheels, C, substantially as shown, when such wheel or wheels are used, upon which to suspend and propel forward the body of such figure, so as to leave the legs free to be operated to imitate the running movements of a quadruped, as shown.

Second, I claim the use or employment of a wheel or wheels, upon which animal automatic figures are suspended and propelled forward, of an irregular or eccentrical form, so as to give a rising and falling movement to the head and shoulders of such animal moving figure at each stride or movement of the legs.

58,007.—Clothes Pin.—W. G. Ward, Savona, N. Y.
I claim a clothes pin consisting of the parts, A B and C, all constructed, combined, and operating substantially as shown and described.

58,008.—Water Wheel.—John S. Warren, Port Chester, N. Y.
I claim the upper and lower inclined or conical plates, a a', of the wheel, with the buckets, b, scolloped at their inner edges, in combination with the scroll, A, all arranged substantially as and for the purpose specified.

58,009.—Condenser.—J. C. Wharton, Nashville, Tenn.
I claim an improved condenser, formed of a series of hollow disks, D, constructed and connected with each other, substantially as herein described and for the purpose set forth.

58,010.—Amalgamator.—James D. Whelpley and Jacob J. Storer, Boston, Mass.
We claim, First, An amalgamator or separator, consisting of a hollow revolving cylinder, C, partially closed at the ends by centrally pierced disks, B, and revolved at a rate sufficiently high to more than overcome the influence of terrestrial gravity on matters placed within it, substantially as described.
Second, The arrangement of the supply pipe, P, and discharge pipe, P', in connection with a revolving cylinder, C, carrying fluid, and a tank, T, to secure the supply and discharge of fluid or pulp, substantially as described and for the purpose stated.

58,011.—Machine for Cleaning and Brightening Particles of Precious Metals.—James D. Whelpley and Jacob J. Storer, Boston, Mass.
First, We claim brightening metallic particles in finely pulverized and desulphurized ores, when such brightening is effected on the principle of mutual attrition in a cylinder, A, alternately closed during the brightening process, and opened to set free the charge by means of valve, d, in the exhaust pipe, C, intending to claim for this end the principle of alternately closing and opening the cylinder, so as to do the work in a close cylinder, as well as the combination of cylinder, A, valve, d, and exhaust pipe, C, for the purpose and substantially as described.
Second, The combination with feed hopper, B, of a fine grating to prevent the passage of any but very fine dust into the cylinder, and the further combination with said feed hopper, and rendered necessary by the exclusion of any but very fine dust from the charge of the machine and the revolving brush, i, and its discharging pin, K, operating substantially as and for the purpose described.

58,012.—Roasting, Desulphurizing, and Smelting Ores.—James D. Whelpley and Jacob J. Storer, Boston, Mass.
We claim the introduction of finely powdered chemical reagents, floated on an air or steam blast into an atmosphere of heat containing coal in aerial or air-borne combustion, substantially as and for the purpose described.

58,013.—Fence.—J. Whiteside, Coesse, Ind.
I claim an improved portable field fence, constructed and arranged substantially as herein described and for the purpose set forth.

58,014.—Wagon Brake.—Thomas T. Weir, Gallatin, Mo.
First, I claim the combination with the neck yoke, K, tongue, J, forward bolster, F, and brake bar, P, of a rod, M, jointed in two places to accommodate it to the movements of the tongue and forward part of the running gear of the wagon, substantially as described and for the purpose set forth.
Second, The combination of the iron guide brace, T, with the brake bar, P, and with the rear axle, C, and bolster, E, substantially as described and for the purpose set forth.
Third, The combination of the lever, U and rack, W, with the brake rod, M, and with the tongue, J, substantially as described and for the purpose set forth.

58,015.—Hand Spinning Machine.—Dickson Wilson and Henry Fairbanks, Adams Co., Ill.
We claim the pedestal, D, with the uprights or standards, e e, the driving wheel, A, the cords, H H, the spindle, C, the wheel, B, the screws, f f, and the center screws or pivots, G, combined and arranged as above described, or substantially so, for the purposes therein set forth.

58,016.—Carriage Seat.—Luther J. Woodruff, Mohawk, N. Y.
I claim a carriage seat having metallic corner pieces, substantially as and for the purpose described.

58,017.—Steam Generator.—C. S. Bell (assignor to himself and Joseph K .Marlay), Hillsboro', Ohio.
I claim the tubes, B B' B", arranged in rows one above the other and over the fire chamber, A, as shown, in combination with the sections or pipes, C C' C" and E E' E", constructed arranged, and applied substantially in the manner as and for the purpose set forth.

58,018.—Bale Fastening.—T. B. Bunting (assignor to himself and R. L. Delisser), New York City.
I claim the rolled edges, c, of the slotted frame, substantially as described for the purpose specified.

58,019.—Water Elevator. — George B. Curtis, Walcott, N. Y., assignor to P. K. Bronson.
I claim, First, The arrangement in double-bucket water elevators, substantially as shown, of the single tilting lever, D, and its spring bolt, I, in combination with the sliding clutch, C, for the purposes set forth.
Second, The spiral spring, s, and its locking bolt, I, in combination with the tilting bar, D, substantially as and for the purpose herein shown and described.

58,020.—Material for Lubricating.—M. P. Ewing (assignor to H. B. Everest and George P. Ewing), Rochester, N. Y.
I claim, as a new manufacture, an oil produced as above described, when produced from crude petroleum by the evaporation therefrom of the lighter hydrocarbons, in vacuo, by the use of steam, or its equivalent, to prevent burning, substantially as herein set forth.

58,021.—Apparatus for Distilling Petroleum, etc.—M. P. Ewing and H. B. Everest (assignors to H. B. Everest and George P. Ewing) Rochester, N. Y.
We claim, First, The pipes, h h', overlaying each other as specified, and forming a compact body, when employed in combination with a vacuum still having a continuous feed, substantially as herein set forth.
Second, The perforated pipes, i i, for injecting steam into the body of oil, when combined with a vacuum still having a continuous feed, substantially as specified.
Third, The chamber, K, in combination with the retort, A, and neck or tube, C, for catching the overflow, as herein set forth.
Fourth, The pipe, i, and receptacle, H, provided with the cocks, m n o, or equivalent, when combined with the chamber, k, for discharging the overflow without impairing the vacuum, as specified.
Fifth, The combination of the inclosing water tank, I, with the jet condenser, B, substantially as and for the purpose herein set forth.

58,022.—Flute, etc.—Samuel C. Goodsall (assignor to himself and Bennet Hotchkiss), New Haven, Conn.
I claim the within described mechanical arrangement of the keys, substantially as and for the purpose specified.

58,023.—Hand Spinning Machine.—B. A. Grant (assignor to himself and J. B. Coate), Mount Pleasant, Iowa.
First, I claim the combination of the arm, T, upon the car, U, with the U lever, n m, and the spring catch, S', or its equivalent, arranged and operating as and for the purposes described.
Second, I claim in combination with the U lever, n m, the employment of the lever, p, and arm, V, arranged and operating as and for the purposes set forth.
Third, I claim the combination of the jaw, G, spring, b, arm, l, and catch, c d, or its equivalent, arranged and operating as and for the purposes shown and described.
Fourth, In combination with said jaw, G, spring, b, and catch, c d, I claim the arrangement of the pin, r, or its equivalent, as and for the purposes specified.
Fifth, I claim the arrangement of the spring, s and t, and arm, W, with the arm, T, of the car, B, operating as and for the purposes set forth.

58,024.—Loom.—John B. Kershaw (assignor to himself and James C. Dickson), Indianapolis, Ind.
I claim the combination and arrangement of the variable pattern cylinder, X, constructed as described, with the treadles, 6 6, jacks, 9 9, and springs, 10 10, the whole operating as and for the purpose set forth.

58,025.—File.—William T. Nicholson (assignor to the Nicholson File Company), Providence, R.I.
I claim, as a new article of manufacture, a round or curved surfaced file, the teeth of which are severally distinct, as when cut by hand, but the rows of which are arranged in wave lines, substantially as described.

58,026.—Reaping and Mowing Machine.—George S. Reynolds, Tunbridge, Vt., assignor to himself and Francis A. Cushman, Lebanon, N. H.
First, I claim constructing the finger bar, A, of taper form in its transverse section, and with a lip, B, at its outer end, in combination with the track board or clearer, C, attached to the lip, B, by the pivot bolt, a, and provided with a pin or stop, b, substantially as and for the purpose set forth.
Second, The securing of the pitman or connecting rod, F, to the sickle, E, by means of the eye, g, at the outer end of F, and a slide, J, attached, and a pin, h, projecting eccentrically from a rounded portion of a rib, i, on the sickle, substantially as herein shown and described.
Third, Connecting the finger bar, A, to the main frame, H, by means of the bars, I I, and rod, J, constructed, arranged, and applied substantially in the manner set forth.
Fourth, The taper driving shaft, K, in combination with the taper or conical bearing tube, L, substantially as and for the purpose specified.

58,027.—Roller for Wringers.—Hiram Robbins (assignor to himself and Thomas H. Foulds), Cincinnati, Ohio.
I claim the elastic roll, B, of rubber, vulcanized upon the longitudinally flanged or ribbed and perforated shaft, A a d, substantially as set forth.

58,028.—Machine for Cutting Rubber into Threads.—D. W. Rust and George Buzzee (assignors to the East Hampton Rubber Thread Company), East Hampton, Mass.
We claim covering a cylinder with "mixed" rubber or other equivalent material, as a foundation upon which to cut rubber threads, substantially in the manner and for the purposes herein specified.

58,029.—Window-shade Fastening.—Elbridge J. Steele (assignor to himself and A. E. Taylor), New Britain, Conn.
I claim, First, The constructing of a window-shade fastening, with a slot, s, in the underside of which is a recess for receiving the cord, g, between it and the window casing, a hole, s, for the cord to pass through over the shoulder, f, with a crease or corrugation in it to prevent slipping, combined with the spring lever clamp, b, substantially as and for the purposes herein described.
Second, I also claim the lever clamp, b, with a recess in it for receiving the cord under the lower limb, in combination with the spiral spring, d, and the bed plate, a, constructed and operated substantially as and for the purposes herein specified.

58,030.—Carriage Wheel.—Richard Walker (assignor to himself and Peter Broadbrooks), Batavia, N. Y.
I claim, First, The combination of the ferrule, E, sleeve, G, nut, H, screw, F, and band, I, with each other, and with the spokes, B, and fellies, C, substantially as described and for the purpose set forth.
Second, The combination of the wedge or wedge-shaped nut, J, with the fellies, C, cap or band, I, and screw, F, substantially as described and for the purpose set forth.

58,031.—Tempering Springs.—P. Whysall and J. Porritt, Port Jervis, N. Y., assignors to themselves and M. M. Livingston, Brooklyn, N. Y.
We claim, First, The process of tempering springs, wire, etc., substantially as herein described.
Second, For the purpose of hardening, cooling, and tempering springs, wire, etc., we claim a bath composed of the chemical agents herein specified.
Third, In carrying out our process, we claim the employment of a vat, A, having a water chamber, B, all around it, and pipes, a b, letting into said chamber, whereby a constant current of cold water may be kept up for cooling the liquid in the vat, A, as herein shown and described.

58,032;—Musical Instrument. — George Woods (assignor to Henry Mason, Emmons Hamlin, Lowell Mason, Jr., and D. J. Mason), Cambridge, Mass.
I claim, First, The slide valve, E, with openings so arranged as to allow communication between the exhaust chamber or pump or bellows of a musical instrument, and one or more of the bellows or pneumatic stop levers, G, when the valve is moved to a proper position, substantially as described.
Second, I also claim the combination of the pipe, F, perforated on its bottom, with the air passage, J, leading to the exhaust chamber, C, and the passage, K, of the pneumatic stop levers, G, substantially as shown.

58,033.—Soda Fountain.—E. B. Wright, Cincinnati, Ohio, assignor to E. D. Finch and William H. Russell, Kokomo, Ind.
I claim the provision of the elevated reservoir, A, pipe, B, coil, B', refrigerating chamber, C, and fountain, D, combined and adapted to operate as set forth.

58,034.—Method of Curing Rheumatism.—Louis Fouilloux, Clermont Ferrand, France.
I claim the within described process of treating the part or parts of the body effected with oxygen gas and heated air, substantially as and for the purpose set forth.

58,035.—Seamless Pocket.—Gustav Kottgen, Barmen, Russia.
I claim a seamless pocket so woven with others that when separated its mouth will be made on the upper side, and adapted to be used for the purpose specified, substantially as described.

58,036.—Impregnating Substances with Preservative Material. — Emile Sabathe and Louis Jourdan, Paris, France.
We claim preserving vegetable or animal substances, whether in a raw or manufactured state, by means of a soap, as herein described, having a metallic base, insoluble in water but soluble in volatile liquids, or by heat or distillation, and applied in such soluble condition to the article or thing to be preserved by it, substantially as herein set forth and explained.

58,037.—Coating Iron and Steel with Gold, Silver, etc.—Jacob B. Thompson, Middlesex County, England. Patented in England Oct. 7, 1865.
I claim the process hereinbefore described of coating an article of iron or steel with a precious metal by first coating the article with pure iron and then with the precious metal, substantially as set forth.

58,038.—Steam Generator.—William Louis Winans and Thomas Winans, London, England. Patented in England June 23, 1866.
We claim the combination and arrangement of the valves, g, valves, g*, sector pieces, h, ring, j, tangent screw, j, block, k, bevel wheel, l, the circular tubes, f, dome, d, space, a, tubes, b, whereby the heated vapors may circulate among the tubes, f, or pass through the space, c, surrounding the dome, as may be desired, substantially as described for the purpose specified.

58,039.—Steam-engine Valve.—William S. Cooper, Philadelphia, Pa.
I claim the guiding rim, m, applied to the chest and spindle of a stop valve, substantially in the manner described.

REISSUES.

2,353.—Horse Rake.—Samuel L. Denney, Christiana, Pa. Patented Aug. 4, 1863. Antedated April 2, 1863.
I claim, First, The bar, c, connecting the ends of the thills, A, which are suspended from the axle, F, in combination with the clearing fingers, E, all arranged and operating in the manner described.
Second, The cast hollow casing, A', in combination with the arms, a and b', as and for the purpose set forth.
Third, The guard, g, constructed and used in the manner described.
Fourth, The guard, g, in combination with the tang, t', as and for the purpose set forth.
Fifth, The serrated rim, P, or equivalent, secured to the spokes or hub of the rake wheel, in combination with the arm, a, attached to the rake axle or spindle, the arm, b', the rod, I, the lever, R, the spring, X, and the curved standard, Y, all arranged in the manner described.

2,354.—Harvester.—James S. Marsh, Lewisburg, Pa. Patented Feb. 10, 1863.
I claim, First, The combined raking and reeling apparatus, which rotates around a vertical shaft, when its arms adjust themselves successively from a horizontal to a vertical position, and when the combined apparatus is so located that its arms swing on hinges which are below the highest point of the drive wheel, and the extent of the sweep of any one of the arms does not interfere with the driver seated on any part of the draft frame, which is outside of the drive wheel, substantially as described.
Second, The construction and adaptation of a combined rake and reel which revolves entirely around a vertical center, so that it may be applied to the harvester at a point which is on the inside of the drive wheel, and below the highest point of said wheel, substantially as described.
Third, Locating the hinges of the respective arms of the combined rake and reel around a center which is on the inner side of the drive wheel, and below the top of said wheel, substantially as described.
Fourth, Attaching each of the respective arms of the combined rake and reel to a hinge or pivot, which is on the inner side of the drive wheel, and below the top of the same, substantially as described.
Fifth, The adaptation of a raking and reeling apparatus combined, which revolves entirely around a vertical center, for application to the inner side of the draft frame of a harvester, at a point below the top of the drive wheel, substantially as described.
Sixth, The construction of the cam, R, of the combined rake and reel, in the manner described and shown.
Seventh, The construction of the crown wheel with boxes for a series of rake and reel arms, in the manner described and shown.
Eighth, The linking devices described, or their equivalents, applied to the arms of the raking apparatus, substantially as described.
Ninth, The use of the inner bearing of the drive wheel as the support of the center, on which the combined rake and reel revolve, substantially as described.
Tenth, The construction of the shaft or center, P, of the rake and reel bars, and the inner segment of the drive wheel, in one piece, in the manner described.
Eleventh, The combination of the cam, R, hinged rake and reel bars, and adjustable links, so as to keep the rake and reel bars firmly in contact with the grain in the field and on the platform, substantially as set forth.
Twelth, The arrangement of the sliding and turning spring pin, p, incline, p2, loose bevel pin, Q, and the raking and reeling apparatus, substantially as described.
Thirteenth, The adjustable grain guard, K, constructed substantially as described, and applied to the inner front corner of the draft frame.
Fourteenth, The combination of a draft frame, platform, driver's seat, device for adjusting the cutting apparatus, and a continuously revolving rake and reel combined, substantially as and for the purposes set forth.
Fifteenth, The combination of the device, T, on the outer divider, and a combined continuously revolving rake and reel, substantially as described.
Sixteenth, So constructing a harvester and a raking and reeling apparatus combined, that a driver can ride on the machine, and from his seat adjust both the rake and reel, and cutting apparatus and platform without stopping the machine, substantially as described.
Seventeenth, So arranging a revolving raking and reeling device, having two or more arms, including the rake as one arm, that the driver can sit on the machine and driver the team, the shaft of the rake and reel being at or nearly at right angles with the grain platform, and the arms of rake and reel not sweeping over the frame on whch the driver is located so as to interfere with the driver on his seat, substantially as described.
Eighteenth, The combination of a central shaft, a revolving hub or crown wheel, a cam, and a hinged rake and reel arms, which are bent or curved near their hinging ends, as described, whereby the rake and reel arms, although hinged in rear of the cutting apparatus, are capable of reeling in and raking off grain at the inner front corner of the platform, as well as at the outer front corner thereof, and whereby, also, these arms are caused to incline over toward the grain side of the platform when they rise to their greatest altitude, substantially as described.

2,355.—Process of Bronzing or Coloring Iron.—Hiram Tucker, Newton, Mass., assignor to the Tucker Manufacturing Company, Boston, Mass. Patented Dec. 15, 1863. (Div. 1.)
I claim the process of ornamenting iron, in imitation of bronze, by the application of oil and heat, substantially as described.

2,356.—Manufacture from Iron in Imitation of Bronze.—Hiram Tucker, Newton, Mass., assignor to the Tucker Manufacturing Company, Boston, Mass.
I claim the new manufacture, hereinabove described, consisting of iron ornamented in imitation of bronze by the application of oil and heat, substantially as described.

Patent Claims.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Notes and Queries

G. W. C., of Ind.—The refuse spelter produced in galvanizing iron we believe is not refined for use in galvanizing, but is worked up for the poorer quality of brass or other alloy, . . . We know of no cheap substitute for the salammoniac of the flux.

W. H. M., of Ill.—In a system of pulleys where the weight is attached to a movable pulley, no part of the rope of the system sustains more than half of the weight.

H. B., of Ill.—Carbolic acid is obtained from the coal tar of gas works by treating the tar or that part of the distillate from it which boils at 350 deg. to 400 deg. with a strong solution of caustic soda, from which latter it is eliminated by hydrochloric or sulphuric acid. The quantity contained in the tar varies considerably; one per cent is probably near the average.

J. W., of Ill.—Without a description of the particular form of the Blanchard lathe you use, we could not offer an opinion as to the cause of its defective operation in turning ax handles. Your best remedy, it seems to us, would be to apply to the makers of the machine.

C. W. D., of Ohio.—Soapstone and sulphuric acid will not produce water that you or any living organism could drink with impunity. Your experimennt with nitric and sulphuric acid mixed with turpentine was an exceedingly dangerous one. Better not repeat it.

N. F. P., of N. Y.—Your plan of wheels of different diameters for rounding curves is not new, and practically the principle is employed on every street and other railroad.

S. H. H., of N. Y.—A mold made of four parts plaster Paris and two of fine brick dust, mixed with water in which a very little gum arabic has been dissolved, and made of the consistence of cream, will answer the purpose for lead casting admirably. Heat the mold gradually before a fire until well baked, and your mold will turn out a smooth casting.

J. H. P., of N. J.—We do not care to express an opinion upon the advantages or disadvantages of "shampooing." It is merely, and only, a cleaning of the scalp, and is as requisite for that portion of the head, or face covered by the beard as that covered by the hair. We use the shampooing process as a luxury, but the head and beard can be as effectually cleansed by means of pounded or pulverized borax in warm water, succeeded by soap and water, as by any patent preparation or the manipulations of a barber. The barber, if he does his duty, will give you better satisfaction than those "of your own household." Employ him.

S. W. C., of N. H.—The annoyance of the hiccough can be stopped so easily that everybody should know how it is done. It is occasioned by the convulsive and involuntary action of the diaphragm, which lifts the stomach, as in vomiting and sea-sickness, which action is occasioned or possible only when the stomach is empty. The remedy is simple and infallible. Drink water or any other beverage slowly, with continual swallowing, so long as you can hold your breath. If you do not breathe in the process you "tide over" the convulsion, and your hiccough is gone.

THE MARKETS.

The fall trade is fairly inaugurated and business is quite active. Gold quotations remain steady and the money market easy, but with a general predilection for short time paper. The prices of breadstuffs have somewhat advanced, which can be attributed mainly to causes temporary in their character. The influx of gold from Europe and the demand for our government securities abroad will tend gradually to reduce prices, although any sudden depression in commercial values is hardly to be anticipated. On the whole, the aspect of business generally is encouraging.

ASHES—Pots are quite dull, but with continued light receipts, market steady. Pearls are nominal.

BRICKS—Common Hard, $10 50@$11 50. Croton and Philadelphia are unchanged at $14@$15 for the former, and $40 for the latter.

COFFEE—Slight advances for lower grades of Rio.

COPPER—Detroit, 31@31½; Portage Lake, 31.

COTTON—Prices advanced ¼@1₱ ct. for Middling grades.

FLOUR—Prices have materially advanced. Common brands rule from $8 90@$11 10; Ohio fancy brands $11 15@$11 20; Genessee extra, $11 60@$13 50.

GRAIN—Wheat advanced slightly. Milwaukee, $2 25@$2 37 Amber, $2 75; North Carolina Red, $2 86. Rye, Western, 81c; Corn, no decided change. Oats, 44@48, Chicago; 47@50 Milwaukee.

IRON—Market dull. No. 1 American pig $48@$50. Scotch, $47@$50.

LATHS—Are firm, with sales of Eastern at $4, three months.

LEAD—Pig is steady, with a fair demand; sales about 400 tons ordinary Foreign at 6¾@7 cents, gold. Bar is steady at $10 50, and Sheet and Pipe $10 70₱100lb, net cash.

LEATHER—The market for Hemlock Sole continues dull, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33@34 cents; Middle do., 35@36; Heavy do., 36@37; California Light, 31@32; Middle do., 33½@34½; Heavy do., 34@35; Orinoco, etc., Light, 31@32; Middle do., 33@34; Heavy do., 29@32; Slaughter Upper in Rough, 31@33. Oak Sole is in light stock, and the market is firm. French and American Calf Skins are firm with a fair demand.

LIME—The market for Rockland is steady, with sales of 4,450 bbls., at $1 60 for Common, and $2 10 for Lump, cash. Glen's Falls is firm at $1 60 for Lump, and $2 25 for "Jointa," cash. Rosendala Cement, $1 75, cash.

LUMBER.—The market for Eastern Spruce and Pine is moderately active, with sales of 545,000 feet Spruce at $21@a$22 50, usual terms.

MOLASSES.—We have still to notice a dull and weak market, ut the decline cannot be said to have made any further progress. The sales are 474 hhds. and 95 tcs., tart Clayed Cuba at 44 cents; 155 hhds. Cuba Muscovado, 45@46; 100 hhds. and 25 bbls. Porto Rico, 60@75; and 46 hhds. inferior do., 51, 4 mos.

NAILS—Cut are very firm and scarce, with a tendency to advance; some sizes are scarce, and for these ¼ cent more is paid. We quote: Cut, 6¾@7 cents; Clinch, 8½; Forged Horse, 12.

SUGAR.—Quotations slightly reduced. Fair 10½@10⅝ cts; Good 10⅝@10¾. Refined 16½ for best Crushed, Granulated and Ground, 15¼ for White A, and 15 for Yellow C.

WIRE—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 18 covered, and 35c. for uncovered.

WOOL—Market unsettled. Western Fleeces at 48@50c. for low grades, 55 for ordinary, and 65@72½for choice—the latter price for Ohio picklock; super and extra pulled, 53@65; short staple at 35; Texas, 15@18 for inferior, 20@24 for ordinary, and 25@30 for superior.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of the reception of their funds.

NEW RATES OF ADVERTISING:

FORTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that eight words average one line. Engravings will not be admitted into our advertising colums, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

BULLOCK'S AMERICAN COTTAGE BUILDER.
Just published.

THE AMERICAN COTTAGE BUILDER:

A Series of Designs, Plans, and Specifications, from $200 to $20,000, for homes for the people. Together with warming, ventilation, drainage, painting, and landscape gardening, by John Bullock, architect, civil engineer, mechanician, and editor of "The Rudiments of Architecture and Building," etc. Illustrated by seventy-five engravings. A new edition in one volume. 8vo. Prince (by mail, free of postage).....$3. 50.

CONTENTS:—Generally.—Where to build a cottage; bird cottage; objects desired. The Various Parts.—Walls; cob walls; mud walls; Silverlock's hollow walls; Dearnes's hollow brick walls; Loudon's hollow brick walls; flint built walls; walls of framed timber, rubble and plaster; walls of hollow bricks; covering for external walls; inside work; floors; lime-ash floors; concrete floors; plaster floor; asphalte; floor of hollow pots; tile floor; floors of arched brickwork in mortar; fire-proof floor; tile-trimmer; girder floor; stairs formed of tile; roofs; thatch; tile for roofing; slate roof; cast-iron roofing; eaves-gutter; chimney-shaft; ventilation and warming. Terra del Fuego Cottage. Prairie Cottage—Cottage of unburnt brick plan; cross section; side view; manner of laying the brick and the foundation; chimney-cap, perspective and top views. The Farm Cottage.—Ground floor; attic floor. The Village Cottage. Italian Cottage. Thatched Cottage. Cottage of the Society for Improving the Condition of the Poor. Warming and Ventilation.—Ventilation. Model Cottage.—Hollow brickwork. Rural Cottage.—Basement plan; plan of basement; plan of principal story. Drainage. Rural Homes.—Circumstances to be taken into consideration in choice of a situation; elevation; the character of the surface on which to build; aspect; soil and subsoil; water; villa; rural home, No. 1; views of a suburban residence in the English style; rural home, No. 2; rural home, No. 3; rural home, No. 4. Paint and Color. Suburban Residences.—Gothic suburban cottage of C. Prescott., Esq., Troy, N. Y.; basement; first floor; attic; second floor; suburban octagonal cottage. Landscape Gardening.—First steps in forming a landscape garden; the roads and paths; trees, shrubs, and planting; hills and mounds; valleys and low grounds; rockwork; of water, and its appropriation or adoption; fountains; general observations; formal gardening; pleasure grounds and flower gardens; the flower garden; the greenhouse; the conservatory. Cost.—The Terra del Fuegan cottage; the prairie cottage; the village cottage; the Italian cottage; the thatched cottage; the cottage of the Society for Improving the Condition of the Poor; Prince Albert's model cottage; the rural cottage; Mr. Fowler's octagonal cottage; rural home, No. 1; rural home, No. 2; rural home, No. 3; the suburban residence; the octagonal suburban residence designed by Wilcox; the Byzantine cottage; the Gothic suburban residence designed by Mr. Davis. Two residences.—The Byzantine cottage; ground plan; plan of second story; the Gothic suburban residence of W. H. C. Waddell, Esq., New York; first floor; second floor. Artist's and Artisan's calling.

Bullock.—The Rudiments of Architecture and building, for the use of architects, builders, draughtsmen, machinists, engineers and mechanics. Edited by John Bullock, author of "The American Cottage Builder." Illustrated by two hundred and fifty engravings. In one volume, 8vo.....$3 50.

☞ The above, or any of my Practical and Scientific Books, sent by mail free of postage, at publication price.

My new Catalogue to July 1, 1866, sent free of postage to any one who will furnish his address.

HENRY CAREY BAIRD,
Industrial Publisher,
13 2] No. 406 Walnut street, Philadelphia.

STEAM CARRIAGES for Common Roads.—The subscriber would like to contract with any parties who would like a perfect steam pleasure wagon, built upon a new and the most perfect principle yet invented, of the very best material, with steel boiler and homogeneous steel throughout, instead of iron. The whole finished in the very best style and workmanship. Weight, complete, less than 500 pounds. Will run on any good road from ten to twenty miles per hour; makes no noise or smoke; consumes very little fuel and water, and is the only style of steam wagon that will give satisfaction. Delivered on cars for $850.

For particulars, address H. S. TAYLOR,
13 1*] Derby Line, Vt.

TAYLOR, BROTHERS & CO.'S BEST YORKSHIRE IRON.—This Iron is of a Superior Quality for locomotive and gun parts, cotton and other machinery, and is capable of receiving the highest finish. A good assortment of bars in stock and for sale by JOHN B. TAFT, sole agent for the United States and Canadas. No. 18 Batterymarch-st., Boston. 13 15*

WROUGHT IRON WELDED TUBE OF ALL sizes; Upright Drill Presses; Pelce's Improved Gas Pipe Screwing Machines, and all other Tools used by Steam and Gas Fitters. Also, Brass Work and Fittings manufactured and for sale by CAMDEN TUBE WORKS,
Second and Stevens-sts., Camden, N. J.
☞ Please send for illustrated catalogue. 13 12*

FUEL ECONOMIZED AND POWER INcreased by the use of Carvalho's Steam Super-Heater. Boilers deficient in power, or wasteful of fuel, are greatly benefited by its attachment, as it prevents all "priming," and saves 25 per cent of fuel. Agents to manufacture wanted. Address, for circular, etc. HENRY W. BULKLEY,
13 6*] 57 Broadway, New York.

CIRCULAR SAWS,
WITH EMERSON'S PATENT MOVABLE TEETH,
Our Patent Teeth inserted in old saws and warranted as good as new. Also, Emerson's Patent Gaging and Sharpening Swage, for spreading the points of saw teeth. Send for descriptive pamphlet with new price list. AMERICAN SAW COMPANY,
13 5*] 2 Jacob street, near Ferry street, New York.

BAIRD'S PRACTICAL AND SCIENTIFIC BOOKS.
LIST NO. 7.

Molesworth.—Pocket-book of Useful Formulæ and Memoranda for Civil and Mechanical Engineers. By Guilford L. Molesworth, Member of the Institution of Civil Engineers, Chief Resident Engineer of the Ceylon Railway. First American, from the Tenth London edition. Ready Sept. 15. Tucks..$2.

CONTENTS:—Civil Engineering—surveying, leveling, setting out, etc.; earthwork, brickwork, masonry, arches, etc.; beams, girders, bridges, etc.; roofs, floors, columns, walls, etc.; railways, roads, canals, rivers, docks, etc.; water-works, sewers, gas-works, drainage, etc.; warming, ventilation, light, sound, heat, etc. Mechanical Engineering—gravity, mechanical centers and powers; mill-work, teeth of wheels, shafting, belting, etc.; alloys, solders, and workshop recipes; steam boilers, and steam engines; water wheels, turbines, etc., and windmills; paddle and screw steamers; miscellaneous machinery.
Weights and Measures, English and Foreign—logarithms of numbers; triangles, trigonometry, and tables of sines, etc.; properties of ellipse, parabola, circle, etc.; mensuration of surfaces and solids; tables of areas, and circumferences of circles; weights and properties of materials; squares, cubes, powers, roots, and reciprocals of numbers; engineering memoranda and tables; supplement by J. T. Hurst, C. E., containing additional engineering memoranda and tables; tables by Lewis Olrick, C. E.

Miles.—A Plain Treatise on Horse-shoeing, with Illustrations. By William Miles, author of the "Horse's Foot."..$1.

Morfit.—A Treatise on Chemistry, applied to the Manufacture of Soap and Candles: being a Thorough Exposition, in all their Minutiæ, of the Principles and Practice of the Trade, based upon the most recent Discoveries in Science and Art. By Campbell Morfit, Professor of Analytical and Applied Chemistry in the University of Maryland. A New and Improved Edition. Illustrated with 260 engravings on wood. Complete in 1 volume, large 8vo.....$20 00.

Mortimer.—The Pyrotechnist's Companion: By G. W. Mortimer. Illustrated. 12mo, cloth.....$1 25

Napier.—Manual of Electro-Metallurgy: Including the Application of the Art to Manufacturing Processes. By James Napier. From the Second London Edition, Revised and Enlarged. Illustrated by Engravings. In one volume, 12mo, price.....$1 50.

Napier.—Chemistry Applied to Dyeing. By James Napier, F.C.S. Illustrated. 12mo.....$3 00.

Nicholson.—Bookbinding: A Manual of the Art of Bookbinding: Containing Full Instructions in the Different Branches of Forwarding, Gilding, and Finishing. Also, the Art of Marbling Book-edges and Paper. By James B. Nicholson. Illustrated. 12mo, cloth.....$2 25.

CONTENTS:—Sketch of the progress of bookbinding, sheet-work, forwarding the edges, marbling, gilding the edges, covering, half-binding, blank binding, boarding, cloth-work, ornamental art, finishing, taste and design, styles, gilding, illuminated binding, blind tooling, antique, coloring, marbling, uniform colors, gold marbling, landscapes, etc.; inlaid ornaments, harmony of colors, pasting down, etc.; stamp or press work, restoring the bindings of old books, supplying imperfections in old books, hints to book collectors, technical lessons.

Norris.—A Hand-book for Locomotive Engineers and Machinists. By Septimus Norris, C. E. New Edition, Illustrated, 12mo, cloth.....$2 00.

Nystrom.—On Technological Education and the Construction of Ships and Screw Propellers for Naval and Marine Engineers. By John W. Nystrom, late Acting Chief Engineer U. S. N. Second Edition, revised with additional matter. Illustrated by 7 engravings. 12mo.....$2 50.

The above or any other of my Practical and Scientific Books sent by mail, free of postage, at the publication price.

☞ My New and Revised Catalogue of Practical and Scientific Books sent free of postage to any address.

HENRY CAREY BAIRD,
Industrial Publisher,
12 No. 406 Walnut street, Philadelphia.

MACHINE KNIVES, CUTTING TOOLS, etc.
The subscribers are prepared, with an experience of twenty years, to manufacture large cutting instruments and tools requiring a superior edge and temper—where quality is the chief requisite. Dyewood and Chipper Knives, Leather Splitting Knives, Paper Knives, Shear Blades, Box-makers' Shears, Knives for Planing and Molding Machines, Spoke Lathes, Cork Machines, etc., made to order and warranted. Parties desiring it can have testimonials of the quality of our tools by a circular. JENKINS & TONGUE,
1*] Nos. 33 and 35 Richmond street, Philadelphia.

RAWHIDE ROPE AND SASH CORD.—The Subscriber feels confident in presenting this article as superior to any other rope, where great strength, durability, and elasticity are requisite. The small sizes have been thoroughly tested by some of our most experienced architects and builders, and by them pronounced the best article for Sash Cord, and for Hoisting Dumb Waiters, ever produced, possessing nearly as much strength and quite the durability of cat-gut. It may be procured of most of the Machine Band Makers, or of the Manufacturer,
13 5*] EDWARD G. VOYSE, 33 Grand street, Williamsburgh.

$5 00 TO $25 00 AVERAGE PER DAY.
MORE AGENTS WANTED
To sell and put up Taylor's Patent
DOOR BELLS,
(with crank). No wires used, put up in five minutes. Agents are making from Five to Twenty-five dollars per day. Traveling agents wanted in every county. A. E. TAYLOR, Patentee,
13 3*] New Britain, Ct.

POLYTECHNIC COLLEGE.
—14th YEAR.—
THE TECHNICAL SCHOOLS, COMPRISING,
The School of Mines,
The School of Civil Engineering,
The School of Mechanical Engineering.
The School of Practical Chemistry,
The School of Architecture,
Will begin September 18. For Catalogues and further information address ALFRED L. KENNEDY, M.D.,
1*] President of Faculty, College Building, Philadelphia.

"ON TRIAL."—"RICH AND RACY." "TIP-TOP." "LOOK AT IT." All Pictorial Double Numbers. A capital Family Magazine. THE ILLUSTRATED PHRENOLOGICAL JOURNAL sent half a year "on trial"—July to January—for $1. Full of Physiognomy, Ethnology, Phrenology, Physiology, Matrimony, Whom to Marry, When to Marry, Right Age, Self-Improvement, Choice of Pursuits, etc., information found nowhere else. Three Pictorial Double Numbers now ready. Six months, $1; a Year, $2. Address
13 2] FOWLER & WELLS, 389 Broadway, New York.

PATTERN LETTERS and Figures (metallic), for foundrymen, machinists, pattern makers, inventors, etc., to letter patterns for castings. Address KNIGHT BROS.,
13 5*] Seneca Falls, N. Y.

WOOLEN MACHINERY FOR SALE.—Iron frame cards, roll cards, trusters, condensers (seven rolls), jacks, looms, grinders, spoolers, etc., etc. All new and of the latest and most improved pattern. Office, 91 Maiden Lane.
13 4*] UNION IRON WORKS, Rhinebeck, N. Y.

TO BUILDERS.—
Patent Rolled Plate Glass for Skylights for sale very low by
E. & H. T. ANTHONY & CO.,
501 Broadway,
Agents of Southbridge Glass Works.
18 13]

FOR SALE.—To Manufacturers of Harness Makers' Tools. The U. S. right for Taylor's Patent Lap Skiver
13] J. S. P. TAYLOR, Oxford, Butler County, Ohio.

WANTED.—TWO SAW MAKERS WHO fully understand the business in all its branches. Apply to
13 1*] AMERICAN SAW COMPANY, Trenton, N. J.

FOR SALE.—A NEW AND USEFUL PATENT in universal demand, upon reasonable terms. Call upon or address BOYD ELLIOT, Room 45, 355 Broadway, N. Y. [13 2*

VALUABLE British Patent for Sale—Producing superb Lamps, and a character and scope of illumination, from petroleum and other hydrocarbons, never before attained. Address H. D. VAN ORDEN, 187 Greenwich st., New York. [13 1*

WROUGHT IRON TAPS AND DIES.—
Superior to cast steel, and much cheaper. I am patentee of a process for making wrought iron taps and dies, which are superior to those of cast steel in strength and durability, never springing in tempering, and cheaper than the ordinary kinds, costing only about one-half the price of steel ones, and of at least equal durability. For rights to manufacture, or territorial rights, address
13 1] FRANKLIN S. GREGG, Cincinnati, Ohio.

FOR SALE.—STATE AND COUNTY RIGHTS of Frazer & Hinchman's Patent SAW SHARPENER. Apply to [13 1*] C. P. FRAZER, 203 Elm street, New York.

FOR SALE.—Patent issued August 1, 1865, for Blacking-box Holder. Illustrated and described in Vol. 14, page 94, of this paper. Address C. E. L. JELLIFFE,
13 1*] Marshall, corner Morrell st., Brooklyn, E. D., N. Y.

NEW FLUE BRUSH.—A FIRST-CLASS INvention; must command a large sale. Send for circular. Rights for sale—the whole or part. G. H. BENEDICT,
1*] 31 Pine street (basement), New York.

A "THUNDERBOLT."—HOWARD'S NEW Breech-loading Rifle; superior to the Needle-Gun—only $25. FOWLER & WELLS, Agents,
339 Broadway, New York.
☞ Circulars on receipt of stamp. 13 2

CHARLES A. CLARK, PASCAGOULA, JACKson county, Mississippi, wishes to correspond with persons who will introduce his va uable improvements. 1*

WANTED TO PURCHASE — MACHINES for Making small paper match boxes. Address, stating price and capacity, GREENLEAF & CO., Milwaukee, Wis. 13 4*

PATENT FOR SALE.—
The Patent Right of Henry Campbell's self-setting Animal Trap. Rights sold by separate States if desired.
1*] 129 Prospect street, Brooklyn, N. Y.

J. T. PHILLIPS, PRACTICAL MILLWRIGHT. Flouring Mills, Saw Mills, Elevators, etc., Built, or Plans and Specifications made for them. Satisfactory references given Address 39 Woodhull street, Brooklyn, N. Y. 13 4*

OBSERVE.—A PERSON EXPERIENCED IN running light machinery and making tempering dies, wishes a situation. Willing to go into the country. Address J. W. C.
11 2*] Brooklyn Post-office, Brooklyn, N. Y.

DISTINGUISHED CHARACTERS.—THE ILlustrated Phrenological Journal for September contains portraits, with descriptions, of Count Bismark, of Prussia; Archduke Albert, of Austria; Queen Emma, of the Sandwich Islands; Joseph Sturge, of England; Horace Vernet, of France; F. N. Gisborn, of Newfoundland; Cyrus W. Field, of New York; and a Group of Native Africans, with articles on Anthropology, Physiology, Psychology, Pneumatology and Physiognomy; Characters in Shakspeare, Hamlet, Cassius, etc. Beaming Eyes, Impressions, Large Noses, Prenatal Influences, Sins of Society, Whom to Elect, Questions for Debating Societies, Phrenology, by John Neal; "Out of Place," by Mrs. Wyllis; Truth and Error, "Quack Medicines," Fagging and Flogging, Female Suffrage, Foreign Arts, etc. A rich number. 20 cents, or $2 a year. FOWLER & WELLS,
11 2] New York.

BUERK'S WATCHMAN'S TIME DETECTOR. —Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. [11 tf

FOR SALE CHEAP.—ONE GEAR CUTTER, one small Steam Engine (of about three horse), without boiler. Can be seen at our office. KEEN BROTHERS,
11 2*] Room 2, 218 Fulton street.

GOVERNMENT AND CITY STANDARD STEAM GAGES.—Parties wishing to purchase a cheap and reliable Steam Gage, are requested to give us a call. All gages used in this city or on steamboats belonging to or tested in this port must conform to our standard. Marine Clocks, Registers, Whistles, Water Gages, etc., constantly on hand. Orders promptly attended to. Old gages repaired at short notice. KEEN BROTHERS, Room 2, 218 Fulton street. [11 4*

$150 A MONTH; NEW BUSINESS FOR Agents. H. B. SHAW, Alfred, Me. [11 13

THE RIGHT TO MANUFACTURE THE HAMILTON HEAD BLOCKS FOR CIRCULAR SAW MILLS, owned and thus far exclusively used by the undersigned, will be disposed of in certain localities upon reasonable terms. It has proven its superiority over all others where it is known. They are in successful operation upon nearly 400 mills.
For information, address us at
HAMILTON, OHIO.
OWENS, LANE, DYER & CO.,
Manufacturers of
11 4*] THE ELLIPSE SAW MILLS.

OIL! OIL!! OIL!!!
For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American", after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world. 1tf

GOVERNORS.

THE GILLESPIE GOVERNOR COMPANY, of Boston, are now manufacturing
GILLESPIE'S PATENT HYDRAULIC GOVERNOR,
for Water Wheels of every description.
After a test of five years' service, this Governor has proved itself far superior to any other hitherto in use, practically accomplishing for Water Power the same as a Cut-off for Steam Power.
Every machine guaranteed to give entire satisfaction to the purchaser, or no sale. Office 13 Kilby street, Boston, Mass.
JOHN S. ROGERS, Treasurer.
TIMOTHY S. HOLTON, Selling Agent.
For sale in New York by J. E. STEPHENSON, 40 Dey street, and GEO. TALCOTT, 69 Liberty street.
☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made. 26 13

CHARLES A. SEELY, CONSULTING AND Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, Instruction, Reports, etc., on the useful arts. 22

STEAM ENGINES WITH LINK MOTION, Variable Automatic Cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, etc. Address
9 tf] M. & T. SAULT, New Haven, Conn.

HAND RAILING SIMPLIFIED. 3d Edition. This is the only work in the English language which has made the Art of Hand Railing perfectly intelligible to the Carpenter and Joiner. Price $5. Sent to any address on receipt of the price. ROBT. RIDDELL, 1214 Hancock-st., Philadelphia. 8 13

GEORGE H. WHITTEN, ORGAN BUILDER, Sufferns, N. Y., is prepared to furnish Plans and Specifications for Organs of all sizes; repairing, tuning, etc. [10 4*

$200 A MONTH IS BEING MADE WITH our IMPROVED STENCIL DIES, by Ladies and Gentlemen. Send for our free Catalogue containing Samples and Prices. Address S. M. SPENCER & CO.,
3 tf] Brattleboro, Vt.

REMOVAL.—
AMERICAN LEAD PENCIL CO.,
NEW YORK,
Have removed to
34 JOHN STREET,
New York.
Factory, Hudson City, N. J. 8 4*

THE BEST FORGING HAMMERS ARE MADE by CHAS. MERRILL & SONS, 536 Grand street, New York. They strike a square blow, and will do more and better work, with less power and repairs, than any other Hammer. Illustrated Circulars, giving full particulars, sent on application. 8 tf

CIVIL AND MINING ENGINEERING,
At the RENSSELAER POLYTECHNIC INSTITUTE, Troy, N. Y. The next Annual Session begins Sep. 12. For the new Annual Register, containing full information, apply to
H. 7 7*] Prof. CHARLES DROWNE, Director, Troy, N. Y.

SCHOOL OF MINES, COLUMBIA COLLEGE,
EAST 49TH STREET, NEW YORK.
Faculty:
F. A. P. BARNARD, S.T.D., LL.D., President.
T. EGLESTON, JR., E.M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E.M., Mining Engineering.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORREY, M.D., LL.D., Botany.
CHAS. A. JOY, Ph. D., General Chemistry.
WM. G. PECK, LL.D., Mining Surveying and Mechanics.
J. H. VAN AMRINGE, A.M., Mathematics.
OGDEN N. ROOD, A.M., Physics.
J. S. NEWBERRY, Geology and Paleontology.
The plan of this School embraces a three-years' course for the degree of "Engineer of Mines, or Bachelor of Philosophy." For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry, and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 1, 1866. The examination for admission will be held September 28, 29. For further information, and for catalogues, apply to
5 8*] DR. C. F. CHANDLER, Dean of the Faculty.

TWIST DRILLS (ALL SIZES) FOR STUBBS'S Wire and Machinist's use, on hand for sale by
26 13] LEACH BROTHERS, 102 Liberty street, New York.

CAN I OBTAIN A PATENT?—FOR ADVICE and instructions address MUNN & CO., 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN $3 a year. 30,000 Patent cases have been prepared by M. & Co.

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins' Air Pumps, Shafting, Pulleys, Gearing Pumps, and General Jobbing. Orders promptly filled for any kind of Machinery. JAMES A. ROBINSON, 164 Duane street, cor Hudson, New York. 1 tf

LUMBER CAN BE SEASONED IN FROM Two to Four days, by Bulkley's Patent, at an average cost of $1 per M. from the green. For Circular or information, address
C. H. BULKLEY, No. 2 Case Building,
4 8*] Cleveland, Ohio.

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machine, address J. A. FAY & Co., Cincinnati, O. 3 1y

MILL-STONE DRESSING DIAMONDS SET in Patent Protector and Guide. Sold by JOHN DICKINSON, Patentee and Sole Manufacturer, and Importer of Diamonds, for all mechanical purposes; also, Manufacturer of Glaziers' Diamonds, No. 64 Nassau street, New York City. Old diamonds reset. N. B.—Send postage stamp for descriptive circular of the Dresser. 6 12*

JUST PUBLISHED—THE INVENTOR'S AND MECHANIC'S GUIDE.—A new book upon Mechanics, Patents, and New Inventions. Containing the U. S. Patent Laws, Rules and Directions for doing business at the Patent Office; 112 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to sell Patents; Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues, Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO. 37 Park Row, N. Y. 15tf

WHEELER & WILSON, 625 BROADWAY, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1t

SETS, VOLUMES AND NUMBERS.
Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New Series) can be supplied by addressing A. B. C., Box No. 773, care of MUNN & CO., New York

TO WRENCH MAKERS.—FOR SALE UPON Reasonable Terms, a valuable patent on a Pipe-Wrench Address, [26 tf] A. B., New York City, Box 773.

ONONDAGA STEEL WORKS.
ESTABLISHED 1853.
We can furnish from our Stock nearly all Sizes of Square, Flat, Octagon, or Round Tool Steel, from ¼ to 4 inches, of Superior Quality. Warranted equal to any imported or produced in this country. SWEET, BARNES & CO.,
Syracuse, N. Y.
New York House,
3 13* GILCHRIST, PIES & SHIPMAN, 40 Broad street.

BUERK'S WATCHMAN'S TIME DETECTOR. —Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular.
J. E. BUERK,
26 18*] P. O. Box 1,057, Boston, Mass.

IMPORTANT TO MANUFACTURERS AND Inventors.—SMITH & GARVIN, No. 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of Light Machinery, Manufacturers' Tools, Models, etc. Satisfactory reference given. 6 25*

IMPORTANT TO MANUFACTURERS USING STEAM FOR POWER.
KELLEY & LAMB'S Improved Steam Engine Governor, the only Governor that will give the same speed, with high or low pressure of steam, or the Engine being light or heavy loaded—is considered by those who have used it to have no equal, and is warranted to give satisfaction. Send for Circular.
LAMB, COOK & CO., Proprietors
20 26* Slatersville, R. I.

TO RAILROAD AND TELEGRAPH COMPANIES.—Telegraph Circuit Breaker and Signal Apparatus. Is readily used by Conductors and Brakemen, and all hindrances to trains on the road immediately telegraphed to despatcher's office. Also, of great value in testing wires out upon the line. Address [4 15*] ALONZO CHACE, Syracuse, N. Y.

GODDARD'S BURRING MACHINE WORKS,
Office, No. 3 Bowling Green, New York,
manufacture the
Patent Steel Ring and Solid Packing
BURRING MACHINES,
Patent Mestizo Wool-burring Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.
Orders respectfully solicited, and prompt attention given, by addressing C. L. GODDARD,
26 tf No. 3 Bowling Green, N. Y.

BULLARD & PARSONS, HARTFORD, CONN. are prepared to furnish Shafting of any size and length, in large or small quantities. Our hangers are adjustable in every point, and fitted with Patent Self-oiling Boxes, guaranteed to run six months without re-oiling, and save 20 per cent of oil. By making a speciality of shafting, we are able to furnish very superior work at reasonable rates. Heavy work built to order. 2 tf

GOULD MACHINE COMPANY,
Newark, N. J.
IRON AND WOOD-WORKING MACHINERY,
STEAM FIRE ENGINES.
Send for a Catalogue. 5 tf

J. A. FAY & CO.,
CINCINNATI, OHIO,
Patentees and Manufacturers of all kinds of
PATENT WOOD-WORKING MACHINERY
of the latest and most approved description
Particularly designed for

Navy Yards	Sash, Blind and Door,
Ship Yards,	Wheel, Felly and Spoke,
Railroad,	Stave and Barrel,
Car and	Shingle and Lath,
Agricultural Shops,	Planing and Resawing Mills, Etc.

Warranted superior to any in use. Send for Circulars.
For further particulars address J. A. FAY & Co.,
Corner John and Front streets,
Cincinnati, Ohio,
Who are the only manufacturers of J. A. Fay & Co.'s Patent Wood-working Machinery in the United States. 4 1y

PRESSURE BLOWERS.
PRESSURE BLOWERS—FOR CUPOLA FURnaces, Forges, and all kinds of Iron Works. The blast from this blower is four times as strong as that of ordinary fan blowers, and fully equal in strength to piston blowers, when applied to furnaces for melting iron. They make no noise and possess very great durability, and are made to run more economically than any other blowing machine. Every blower warranted to give entire satisfaction. Ten sizes, the largest being sufficient to melt sixteen tuns of pig iron in two hours. Price varying from $40 to $345.
FAN BLOWERS, from No. 1 to No. 45, for Steamships, Iron Mills, Ventilation, etc., manufactured by B. F. STURTEVANT,
1 tf] No. 72 Sudbury street, Boston, Mass.

STEAM AND WATER GAGES, GLOBE Valves and Cocks, Steam Whistles, Steam and Gas Fitters' Tools, Oil Well Machinery, etc. Wrought Iron Pipe and fittings for sale at the lowest rates by JOHN ASHCROFT, 50 John street New York. Send for Circulars. 26 12*

$1,500 PER YEAR, PAID BY SHAW & CLARK, Biddeford, Me., or Chicago, Ill. [11 13

FOR DANIELLS'S PLANING MACHINES, Car Mortising, Boring Machines, Car Tenoning Machines, Car Planing and Beading Machines, etc., address
4 1y] J. A. FAY & CO., Cincinnati, Ohio.

A CARD.—TO MECHANICS AND MANUfacturers.—The Chelsea Machine Works of Norwich, Conn., have on hand and are manufacturing Engine Lathes of very superior quality, with Smith's Patent Feed, and Cross-feed, and many other valuable improvements, making them the most desirable tool of its kind in market. The attention of Watchmakers and others is called to our small class of Engine Lathes as being extremely accurate and reliable; also, hand, drill, wood turning, and foot lathes; dial plates for gear cutters, and first-class machinery made to order, gear cutting, pattern making, iron forging, and general machine jobbing. Lathes fitted with scroll chucks when ordered. H. K. SMITH,
11 4*] General Agent and Superintendent.

WANTED—A TURBINE WHEEL, 60 to 100 horse-power. Builders will please address, with circulars, stating price, complete delivered in New York, JOHN H. HALL, President, Fayetteville, North Carolina. [11 2*

PLANER WANTED.—WANTED IMMEDIately a Planer or Shaper, suitable for shaping steel dies, to take in a piece 12 to 20 inches long and 10 to 18 inches in depth and width. Must be stiff and strong, and capable of taking a smooth heavy cut. Send description and price.
LEWIS, OLIVER & PHILLIPS,
11 3*] Pittsburgh, Pa.

WHITE'S GOVERNOR VALVE.—RIGHTS in Wisconsin and Minnesota for sale by P. RANSOM, Galesburg, Ill. 9 6*

ATMOSPHERIC TRIP HAMMERS ARE made by CHAS. MERRILL & SONS, 536 Grand street, New York. They will do more and better work, with less power and repairs, than any other Hammer. Illustrated circulars, giving full particulars, sent on application. tf 9

WANTED.—SOME ONE TO TAKE AN INterest in and manufacture a new Sewing Machine—just patented. Makes the Lock-stitch, without rewinding; also, several other kinds of stitches, warranted to compete with, if not surpass any machine out. Address G. L. DULANEY, Mechanicsburg, Pa 9 5*

PAGE'S GRATE, WATER, FLAME, AND Coal Lime Kiln, on new and scientific principles. Great saving. Fuel, hard or soft coal, peat, or wood. Warranted to burn best finishing lime. Both new and patented 1864, 1866. Rights for sale. C. D. PAGE,
9 6*] Rochester, N. Y.

FRENCH BURR STONE PAINT MILLS—all sizes. Brainard's Iron Power and Hand Paint Mills.
8 10*] HOLMES & BLANCHARD, Boston, Mass.

BROWN'S FRENCH Burr Portable Grist Mills, all sizes. [8 10*] HOLMES & BLANCHARD, Boston, Mass.

FOR ENGINE BUILDERS' AND STEAM Fitters' Brass Work, address
8 26*] F. LUNKENHEIMER, Cincinnati Brass Works.

THE HARRISON BOILER—A SAFE STEAM BOILER.—This new Steam Generator combines essential advantages in Absolute Safety from explosion, in first cost and cost of repairs, durability, economy of fuel, facility of cleaning, and transportation, not possessed by any other boiler.

It is formed of a combination of cast-iron hollow spheres—each 8 inches in external diameter, and ⅝ths of an inch thick, connected by curved necks. These spheres are held together by wrought iron bolts with caps at the ends. The form is the strongest known. Its strength to resist internal pressure is very great—unweakened as it is by punching or riveting, which lessens the strength of the wrought iron boiler plate about forty per cent. Every boiler is tested by hydraulic pressure at 400 pounds to the square inch. It cannot be burst under any practicable steam pressure.

Under pressure which might cause rupture in ordinary boilers every joint in this becomes a safety valve. No other steam generator possesses this property of relief under extreme pressure without injury to itself, and thus preventing disaster.

It is not affected by corrosion, which soon destroys the wrought iron boiler. Most explosions occur from this cause. It has economy in fuel equal to the best boilers, arising from the large extent and nearness to the fire of its heating surface, as also from the waved line of this surface which, thoroughly mixing the gases, induces better combustion, and breaking the flame, causes the heat to be more effectually absorbed than in the ordinary tubular or cylinder boiler.

It gets up steam quickly, and with little fuel. It produces superheated steam without separate apparatus, and is not liable to priming or foaming.

It is easily transported, and may be taken apart so that no piece need weigh more than eighty pounds. In difficult places of access, the largest boiler may be put through an opening one foot square. It is readily cleaned inside and out. Under ordinary circumstances, it is kept free from permanent deposit by blowing the water entirely out, under full pressure once a week. It requires no special skill in its management. Injured parts can be renewed with great facility, as they are uniform in shape and size. When part of the boiler will never need renewal unless unfairly used.

A boiler can be increased to any extent by simply adding to its width, and being the multiplication of a single form, its strength remains the same for all sizes. It has less weight, and takes less than one-half the ground area of the ordinary cylinder boiler, without being increased in hight.

Any kind of fuel may be used under this boiler, from the most expensive to refuse coal dust.

Drawings and Specifications free of charge. For descriptive circulars or price address JOSEPH HARRISON, Jr.,
Harrison Boiler Works, Gray's Ferry Road,
9 13* Adjoining U. S. Arsenal, Philadelphia.

STEAM BOILER EXPLOSIONS PREVENTED by use of Ashcroft's Low Water Detector. Over 5,000 in use. Send for Circular. JOHN ASHCROFT, 50 John st., N. Y. 26 12*

TWENTY-FIVE PER CENT OF THE COST of Fuel Saved annually by the use of Hair and Wool Felt as applied and for sale by JOHN ASHCROFT, 50 John street, New York. Send for Circular. 26 12*

THE NONPARIEL WASHING MACHINE.—"A First-class Machine—one that has no rival to our knowledge."—Scientific American.
Send for free descriptive circular to.
OAKLEY & KEATING,
8 11*] 184 Water street, New York.

"PRACTICAL HANDRAILING."—COPYright on sale for Eastern and Middle States. It is new and extremely simple. One plan adapted to all stairs. Two new and beautiful designs given. Single copies $5. Send for circular. Agents Wanted. WM. SALISBURY, Wheeling, West Va. 12 3*

LAST CENSUS OF THE UNITED STATES, giving the population of every State and County, and of the principal Cities, Towns, and Villages, with a Map of the United States.
Pocket size, flexible cloth cover. Sent by mail for 50 cents.
12 3*] G. W. & C. B. COLTON & CO.

WATER WHEELS.—THE HELICAL JOURnal Turbine, for first-class mills, where great economy of water is desired. Simple, durable, and powerful. Manufactured by the patentee, J. E. STEVENSON, Hydraulic Engineer,
40 Dey street, New York.
☞ Practical Engineers wanted as Agents. 12 6*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, N. Y. 1 tf

WOODWORTH PLANERS, BARLETT'S Patent Power Mortise Machine, the best in market. Woodworking Machinery, all of the most approved styles and workmanship. No. 24 and 26 Central, corner Union street, Worcester, Mass. [4 11*] WITHERBY, RUGG & RICHARDSON.

R. BALL & CO.,
SCHOOL STREET, WORCESTER, MASS.,
Manufacturers of Woodworth's, Daniell's, and Gray & Wood's Planers, Sash Molding, Tenoning, Mortising, Upright and Vertical Shaping, Boring Machines, Scroll Saws, and a variety of other Machines and articles for working wood.
Send for our Illustrated Catalogue. 1 51*

LATHES, PLANERS, AND OTHER TOOLS, on hand and to order, from Lowell Machine Shop.
STEVENSON & PEIRSON,
6 13*] 48 Kilby street, Boston.

PORTABLE STEAM ENGINES, COMBINING The maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & Co., Lawrence, Mass. 1 tf

PATENTED WOOD-BENDERS, FOR FELlies, Furniture, Agricultural Implements, etc. Machines with rights to use, for sale. JOHN C. MORRIS,
9 6* No. 122 East Second street, Cincinnati, Ohio.

ENGINEERS, SURVEYORS, MACHINISTS, Draftsmen, School Teachers, send for the Descriptive Manual of Mathematical Instruments and Drafting Materials, a pamphlet of 112 pages, published and sent free by JAMES W. QUEEN & CO., Mathematical Instmt. Makers, 924 Chestnut-st., Phila. [9 10*

THE STEAM SIPHON PUMP IS THE MOST simple, direct, and effective device for raising water by steam yet discovered. It is an independent lift and force pump, without piston, plunger, valves, or any movable part. It cannot get out of order, or freeze up, and can be used wherever there is a steam boiler, either with high or low pressure. It is an efficient fire engine, and the best bilge pump known. Address
STEAM SIPHON COMPANY,
9 13* 48 Dey street, New York.

MACHINISTS' TOOLS FOR SALE.—3 Iron Planers, 15 feet, 36x36; 10 feet, 40x36; 5 feet, 30x18. These have been used about 6 months. 3 Engine Lathes, 10 feet 17 in. swing, 10 feet 20 in. swing, 10 feet 25½ in. do. For particulars and cuts address STEPTOE, McFARLAN & CO.,
Cincinnati, Ohio.

WOODWORTH PLANERS.—
MESSRS. STEPTOE, McFARLAN & CO.,—Gentlemen:—We are highly pleased with the Woodworth Planer and Matcher, purchased from you, and think it superior to any machine of the kind of which we have any knowledge.
WEARY, SNYDER WILCOX & CO.,
July 27, 1866. Akron, Ohio.

☞ Send for circular and price lists.
STEPTOE, McFARLAN & CO.,
9] Cincinnati, Ohio.

ANDREWS'S PATENT PUMPS, ENGINES etc.—
CENTRIFUGAL PUMPS, from 90 Gals. to 40,000 Gals. per minute, capacity.
OSCILLATING ENGINES (Double and Single), from 2 to 250 horse-power.
TUBULAR BOILERS, from 2 to 50 horse-power, consume all smoke.
STEAM HOISTERS, to raise from ½ to 6 tuns.
PORTABLE ENGINES, 2 to 20 horse-power.
These machines are all first-class, and are unsurpassed for compactness, simplicity, durability, and economy of working. For descriptive pamphlets and price list address the manufacturers,
W. D. ANDREWS & BRO.,
3 tf] No. 414 Water street, N. Y

AMERICAN PEAT COMPANY.—THIS COMpany, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use.
1 12* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

IRON PLANERS, ENGINE LATHES, DRILLS, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address
2tf] NEW HAVEN MANUFACTURING CO., New Haven, Ct.

"POWER-LOOM WIRE CLOTHS" AND nettings, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. 1 36*

MODELS, PATTERNS, EXPERIMENTAL and other Machinery, Models for the Patent Office, built to order by HOLSKE & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 1 tf

OXY-HYDROGEN STEREOPTICONS,
OXY-CALCIUM STEREOPTICONS,
DISSOLVING LANTERNS,
MAGIC LANTERNS, Etc., Etc.
A Large Assortment of American, European, and Foreign Photograph Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 pages, will be sent free by Mail on application.
WILLIAM V. McALLISTER,
21 52* 728 Chestnut street, Philadelphia.

10,000 AGENTS WANTED, IN EVERY TOWN, COUNTY, and STATE, to sell Topliff's Patent Perpetual Lamp Wick. Needs no Trimming. Sample sent for 20c; two for 30c. State and County Rights for Sale.
MURPHY & COLE,
3 tf] 81 Newark Avenue, Jersey City, N. J.

SAW MILLS.—BROWN Bro.'s CIRCULAR Saw Mills, with Stearn's Patent Eccentric Sets, far superior to Rack and Pinion and Screw Sets. No time lost in setting. These Mills are extensively used and much preferred by the best lumbermen in Pennsylvania and Michigan. For sale by
J. E. STEVENSON, Engineer,
12 6*] 40 Dey street, New York.

INCRUSTATIONS IN STEAM BOILERS.—Temple's Liquid removes and prevents Scale from forming. Prevents Corrosion of the Iron. Price reduced. Address
12 3*] A. TEMPLE, Bridgeport, Conn.

KEENER'S PATENT ELLIPTIC HAT RACK, for hanging hats, etc., so as to render it impossible for them to fall. (Illustrated on page 182.) Rights for sale. Apply to
CHAS. H. KEENER,
12 3] 238 Madison Avenue, Baltimore, Md

MANUFACTURERS OF TEXTILE FABRICS. DUTCHER'S PATENT TEMPLES, adapted to weaving all kinds of goods. Also
THOMPSON'S PATENT OIL CANS
for oiling Machinery; neat and economical. Furnished by
21 13 eow* E. D. & G. DRAPER, Hopedale, Mass.

PLATINUM APPARATUS, WIRE, ORE, etc. For circular, address
9 5 eow] H. M. RAYNOR, 748, Broadway, New York.

FOR WHEEL, FELLY AND SPOKE MAchinery, Spoke Lathes, Hub Mortising and Boring Machinery, Etc., address J. A. FAY, & Co., Cincinnati, Ohio. 5tfc

MACHINERY.—S. C. HILLS, NO. 12 PLATT street, New York, dealer in Steam Engines, Boilers, Planes; Lathe, Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines, Woodworth's and Daniels's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills, Johnson's Shingle Mills; Belting, Oil, &c. c

AMESSIEURS LES INVENTEURS—AVIS important. Les inventeurs non familiers avec la langue Anglaise, et qui préfereraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communication seront reçues en confidence.
MUNN & CO.,
Scientific American Office, No. 37 Park Row, New York.

PARTNER WANTED TO TAKE ONE-HALF Interest in Secore's Horse Hay Fork, best in use. Rights for sale. Address [11 2*] C. L. BELLAMY, Hempstead, N. Y.

SMITH'S PATENT FUSIBLE SAFETY VALVE OR PLUG.—These Plugs are in extentive use in England, and are the best application of fusible alloy, for safety from accidents by low water or over pressure; are self-acting, and cannot be tampered with. For sale by
CHARLES W. COPELAND, No. 171 Broadway,
9 8] Sole Agent for the United States.

MASON'S PATENT FRICTION CLUTCHES, for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by
6 tf VOLNEY W. MASON, Providence, R. I.

WATER WHEELS.—
Warren's American Turbine Wheel is extensively taking the place of other wheels throughout the country, where great power, and the saving of water is required. Address
A. WARREN, Agent American Water Wheel Co.,
5 12*] 31 Exchange street, Boston, Mass.

AMERICAN EMERY.—GUARANTEED SUperior to any other Emery in the market. F. K. Sibley's Emery Cloth, covered with American Emery, superior to any other. By F. W. BACON & CO., 84 John street,
Sale agents for New York City. 13 2*

THE AMERICAN VISE—A WELL-CONstructed Parallel Vise, recently Patented—a great improvement on a l others. All sizes on hand, by F. W. BACON & CO., 84 John street, Sale Agents, New York City. 13 2*

ANDERSON & SCHERMERHORN, PATENT and Model Makers, Gearing Cocks, Valves, and Engines. Patterns of every description. Rear No. 47 Ann street, New York, second floor. 11 tf

MORSE'S Patent TWIST DRILLS, CHUCKS, SOCKETS, etc.
A full assortment may be found in New York at F. W. Bacon & Co.'s, 84 John street; Peter A. Frasse, 95 Fulton street; Nathusin, Kugler & Morrison, 229 Bowery. In Boston, at A. J. Wilkinson & Co.'s, No. 2 Washington street; May & Co.'s, No. 1 Broad street. In Philadelphia, Wm. P. Walter & Son's, 1,223 Market street. In Hartford, at Francis & Gridley's, 343 Main street. In San Francisco, at Marsh, Pilsbury & Co.'s, corner Pine and Front streets. In London, England, at Keith & Co.'s, 16 ½ Fenchurch street, and at the Factory, corner Fourth and Bedford streets, New Bedford, Mass. 1*

WOOD & MANN STEAM ENGINE CO.'S CELEBRATED PORTABLE STEAM ENGINES, from 4 to 35 horse-power. Also, PORTABLE SAW MILLS.
We have the oldest, largest, and most complete works in the United States, devoted exclusively to the manufacture of Portable Engines and Saw Mills, which, for simplicity, compactness, power, and economy of fuel, are conceded by experts to be superior to any ever offered to the public.
The great amount of boiler room, fire surface, and cylinder area, which we give to the rated horse-power, make our Engines the most powerful and cheapest in use; and they are adapted to every purpose where power is required.
All sizes constantly on hand, or furnished on short notice. Descriptive circulars, with price list, sent on application.
WOOD & MANN STEAM ENGINE CO.,
7 52* Utica, N. Y. Branch office, 96 Maiden Lane, N. Y. City.

$200 per MONTH is MADE by AGENTS selling the Parker Sewing Machine—the most perfect in existence. Parker Sewing Machine Company, Cincinnati, Ohio. 8 13

IMPORTANT.
A MOST VALUABLE MACHINE for all kinds of irregular and straight work in wood, called the Variety Molding and Planing Machine, indispensable to competition in all branches of woodworking. Our improved guards make it safe to operate. Combination collars for cutters, saving 100 per cent, and feed table and connection, for waved moldings and planing, place it above all others. Evidence of the superiority of these machines is the large numbers we sell, in the different states, and parties laying aside others and purchasing ours, for cutting and shaping irregular forms, sash work, etc.
We hear there are manufacturers infringing on some one or more of our nine patents in this machine. We caution the public from purchasing such.
All communications must be addressed "Combination Molding and Planing Machine Company, No. 211 East 23d-st., New York," where all our machines are manufactured, tested before delivery, and warranted.
Send for descriptive pamphlet. Agents solicited. 10 6*

MANUFACTURERS AND INVENTORS.—PACIFIC PATENT AGENCY, for opening facilities to Manufacturers and Inventors to introduce their products to the public in the departments of Mining, Mechanics, Agriculture, Domestic, Musical and Scientific, on this coast. Address
J. H. ATKINSON,
Northeast Corner California and Kearney streets,
10-6*] San Francisco, Cal.

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. [10 tf

THE 19th ANNUAL EXHIBITION Of American Manufactures and the Mechanic Arts, will be opened in the spacious Hall of the Maryland Institute, Baltimore, on Tuesday evening, October 2d, 1866, and close Oct. 20th.
Articles for Competition and Premium must be deposited before Thursday night, Sept 27th.
For particulars, address the undersigned, or Joseph Gibson, Actuary.
JNO. F. MEREDITH,
7 9] Chairman Exhibition Committee.

IMPROVED STATIONARY AND PORTABLE Steam Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction. Marine Engines, Iron Steamers, Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order. Address T. F. ROWLAND,
9 26* Continental Works, Greenpoint, Brooklyn, N. Y.

IRON CASTINGS AND STEAM BOILERS.—THE HINKLEY AND WILLIAMS WORKS, No 416 Harrison avenue, Boston, are prepared to manufacture common and gun-metal castings, of from ten pounds to thirty tuns weight, made in green sand, dry sand or loam, as desired; Also Flue and Tubular Boilers, and "Hinkley's Patent Boiler," for locomotive or stationary engines, warranted to save a large percentage of fuel over any boiler now in use. 1 13*

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.
Daselbst ist zu haben:

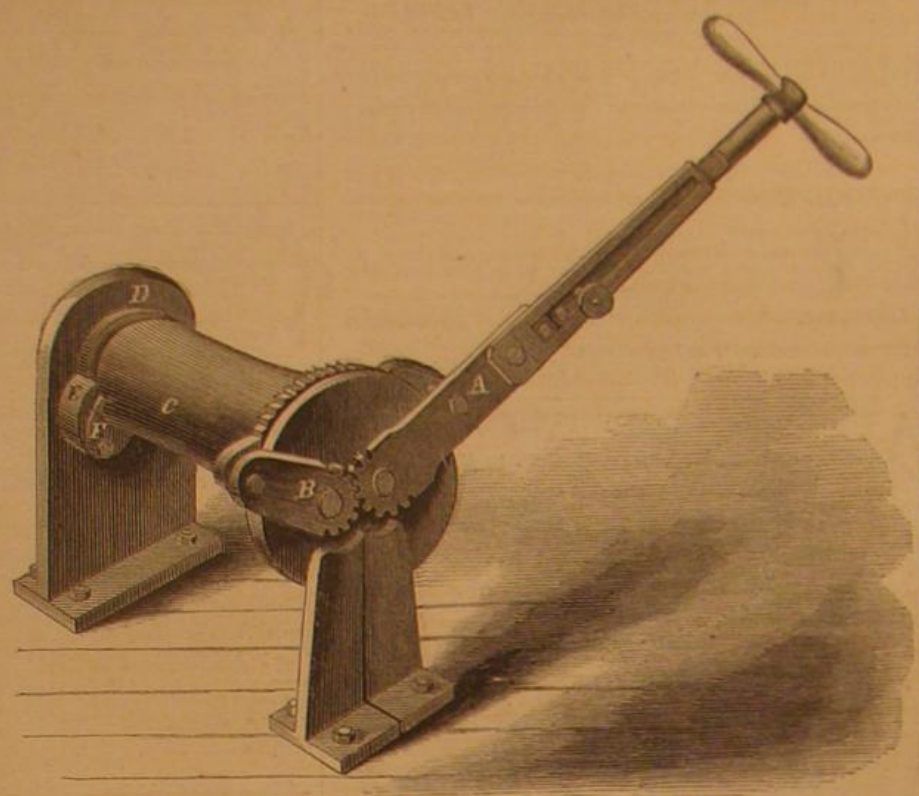
Die Patent-Gesetze der Vereinigten Staaten,

nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Vereinigten Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.
Preis 20 Cts., per Post 25 Cts.

Improved Ship Windlass.

The engraving represents a device for producing a continuous rotary movement of a ship's windlass, with an attachment for separating the coil of the cable to prevent fouling, and a gripe for retaining the chain at any point. The combination appears to be very efficient for each of these purposes.

The lever, A, is provided with a geared segment that meshes with the corresponding geared arm, B. The pawl, on A, has a counterbalance which keeps the point in an inverted position, so that it works with the downward stroke of the lever, while that on the arm, B, engages the ratchet at the upward stroke. It will be seen that both pawls are moved at each stroke, producing a continuous rotary motion. The barrel, C, has a groove, and fitting into it, and secured to the housing, D, is a leader, E, which lays the first coil of the chain or rope, and separates it from the next. This separator is wedge-shaped, large at the top and receding to a thin blade where the cable first engages the barrel. The second and each succeeding coil is, by this means, receded and guided from the first. A check pawl, F, engages in the links of the cable and prevents slipping and the surging and straining frequently so injurious to the windlass and fatiguing to the men.



McGILL'S SHIP WINDLASS AND COIL SEPARATOR.

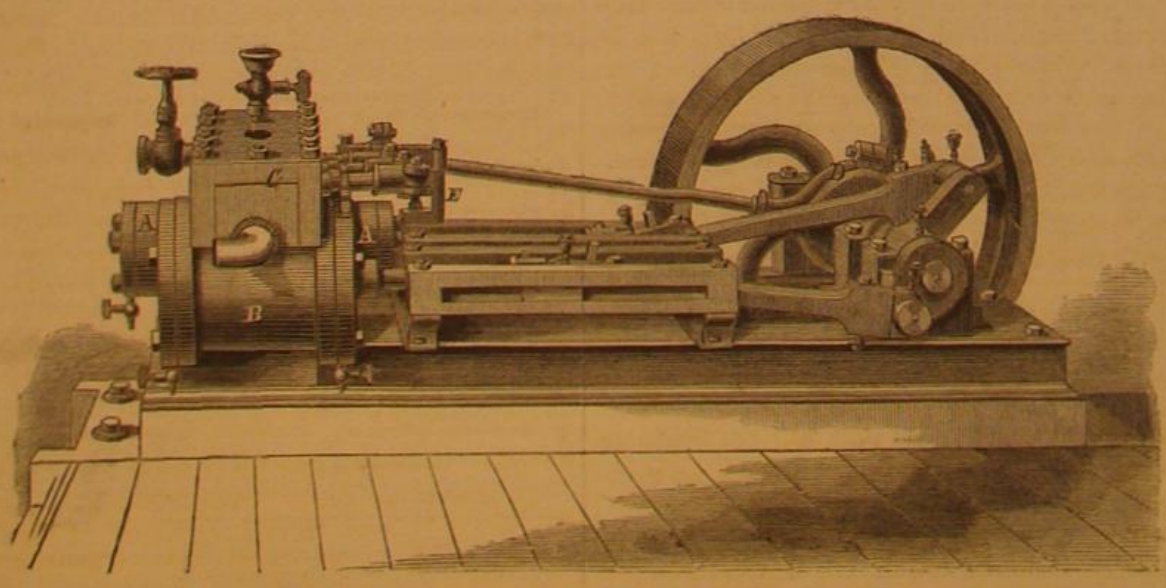
This combination can be arranged to work vertically as well as horizontally, and a combination windlass can be constructed which will work two or more barrels and revolve them in either direction. It is also self-locking at any point, and can be applied to raising any heavy weight.

It is the subject of two patents, bearing the dates of March 14, 1865, and April 18, 1865, issued to W. C. McGill, 277 Walnut street, Cincinnati, Ohio, who will sell rights to use or manufacture for a small bonus on each machine made.

Improved Combined Steam Engine.

It is well known that the steam, as it escapes from the cylinder of a high-pressure steam engine, has not parted with all its power-making force. A number of attempts have been made to utilize this power. It has been attempted to employ two cylinders, using two pistons affixed to one rod. Two cylinders have also been used, the waste steam from one working the piston of the other in only one direction. An attempt has been made to run two cylinders of the same capacity connected to cranks at right angles to one another. We believe none of these have proved to be marked successes, or they have not entirely fulfilled the expectations of their projectors.

The engraving represents an engine differing from either of these. The inventor says:—"It is a well known fact to all conversant with the operation of high-pressure, or non-condensing engines, that the steam, after having performed the work of forcing the piston the length of its stroke, is set free into the atmosphere at a much higher pressure than the atmospheric pressure of 14·7 lbs. per square inch, even when using steam expansively. For instance, a very common point of 'cutting off' is at 'half-stroke,' by which is meant closing the communication between the boiler and the steam piston when the latter has traversed one-half the length of the cylinder, and making use of this half cylinder full of steam, by its expansive force, to perform the remaining half of the stroke. Supposing, in these cases, the boiler pressure to be 80 lbs. per square inch above the atmosphere, as indicated by the steam gage, and the valve to cut off steam at half stroke, the pressure of steam in the cylinder, when the piston is at the end of its stroke, at about which time the egress to the atmosphere is opened, would be about 40 lbs. We have, then, a cylinder full of steam, having an elastic force of 40 lbs. per square inch, above the atmospherical pressure, discharged from the cylinder and



HUNTOON'S COMBINED STEAM ENGINE.

lost, and representing an expenditure of fuel necessary to generate the excess of steam and that necessary to overcome the atmospheric resistance."

In the engraving, A is the main cylinder, and B the expanding cylinder, connected by a common steam chest, C. The main cylinder takes steam directly from the boiler at its full pressure, and is twice the length of the auxiliary cylinder, B. A works the steam expansively, but, instead of discharging into the atmosphere, exhausts into the cylinder, B, which has twice the diameter of A, but only half its length. The pistons of the two cylinders are connected by means of the usual rods to their respective cranks, both of which are on the same line. Of course the crank of A is twice the length of that which determines the stroke of B. The eccentric, D, works a lever pivoted horizontally to a stud on the frame, E. To this lever the valve stems are attached in such a manner that the requisite throw is given the valves of each cylinder.

It will be readily seen that the steam from the long or main cylinder exhausts into the expansive cylinder, which has an increased area of piston, and a stroke decreased proportionate to the reduced pressure of steam.

This combination was patented May, 15, 1866, by Lafayette Huntoon, Milford, Mass., whom address for additional information.

Age of Stone in China.

M. Chevreul, in a communication addressed to the French Academy, brings together some curious facts relative to the age of stone in China. It seems that when Confucius was staying in the Kingdon of Tchen, a bird of prey fell dead before the King. Upon examination it was found to have been killed by an arrow armed with a hard, sharp stone. Confucius was called upon to explain this, and related the tradition that in the year 1122 (B. C.) such a weapon had been presented as a token of sovereignty by Ououang to the first King of Tchen. Search was made in the Royal Museum, and the weapon was discovered. "This proves," says M. Chevreul, "that even at that remote epoch iron weapons had already been introduced into China, and the Stone Age only lived in tradition!" M. Stanislas Julien has confirmed this opinion by several extracts from Chinese encyclopedias, which put the existence of a Stone Age in China beyond doubt.

UNDERGROUND traveling increases at a surprising rate in London. In the first six months of 1863 the number of passengers carried on the Metropolitan line was 4,823,437; in 1864 for the same period, it was 5,207,335; in 1865, it was 7,462,823, but in the first half of the present year it rose to 10,303,395 The revenue has correspondingly increased; in the first of the four periods it was £53,058; in the last it amounted to £102,947.

THE advertising privilege of the Paris Exhibition has been sold for $250,000.

MECHANICS

INVENTORS, MANUFACTURERS.

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other Manufacturing Interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc., Household, Horticultural, and Farm Implements—this latter Department being very full and of great value to Farmers and Gardeners, articles embracing every department of Popular Science, which every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent Law Decisions and Discussions, Practical Recipes, Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July,

Per annum.....$3 00
Six months.....1 50
Ten copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free. Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City.

Messrs. MUNN & CO. have had twenty years' experience in procuring Patents for New Inventions. Inventors who may have such business to transact can receive, free, all needful advice how to proceed.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.