

# Scientific American.

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

Vol. XV.—No. 5.  
[NEW SERIES.]

NEW YORK, JULY 28, 1866.

\$3 per Annum,  
[IN ADVANCE.]

## Improved Brick Machine.

The engraving herewith presented is a perspective view of an improved brick machine, which, with two horses, three men, and a boy, makes 18,000 bricks per day, five at a time, and ten every revolution. With the power of a single horse it makes 20 feet of perfect drain tile per minute.

The vessel, A, in the engraving contains a vertical shaft, which has a series of horizontal radial arms, which, by the revolution of the shaft, thoroughly mix and knead the clay. To the lower end of the vertical shaft is attached a scraper, which delivers, through an opening in the side of the vessel, A, at its bottom, the clay, to another scraper operating under the platform, B, which deposits the material on an endless apron passing over the roller, C. By this apron the clay is brought to the molds, D, in front of the machine, which are raised and lowered by cam-shaped openings in the disk, E, rotated by means of the shaft, F, gearing into the vertical shaft. The lower edges of the divisions forming the molds are sufficiently sharp to divide the clay readily. The followers which traverse between the divisions of the molds are also operated by the disk, E, and press the clay firmly in the molds, when follower and molds together are raised, leaving the brick on the endless apron. A simple device (not represented) delivers the bricks ready for drying.

It is difficult fully to describe the operation of this machine without detailed drawings, but enough can be seen to give practical brickmakers an adequate idea of the improvement. Its rapidity of operation—making two sets of bricks at each revolution of the cam disk—its portability, the thorough mixing of the clay, and the excellent quality of the product, all seem to recommend this machine as one efficient for the work designed.

Patented through the Scientific American Patent Agency June 5, 1866. Manufactured by Ferrell, Ludlow & Co., Springfield, Ohio, to whom all orders should be addressed.

## ON FLYING MACHINES.

Mr. F. H. Wenham lately read a paper before the Aeronautical Society of Great Britain, entitled "Some Observations on Aerial Locomotion, and the Laws by which Heavy Bodies Impelled through the air are sustained," of which the following is an abstract:—

The author commenced by stating that a great amount of power is required to raise a weight perpendicularly in a still atmosphere, on account of the yielding nature of the support. To compensate for this a very large surface would be requisite, and to enable a man to raise his own weight, together with the machine (assumed at 300 lbs.) by his individual strength, about 1,000,000 square feet would be necessary, which of course places the size of the apparatus beyond the range of practicable construction.

As the sustaining surface is diminished, so must the power be increased. If the surface is reduced down to the ratio of one square foot for each pound to be raised (being about the average ratio of weight to wing surfaces in birds) it will require a power of twelve horses to raise a weight of 300 lbs. perpendicularly on still air. In the paper some experiments

passing body of water. If a thin lath of wood is held perpendicularly, and moved rapidly to and fro, with its plane at right angles to the direction of a running stream, a very great increase of resistance will be felt; and if the lath is fixed centrally, with its plane at right angles at the end of a rod, on immersing this in a stream, the resistance measured will be simply that due to the flat superficies of the blade; but if the rod, held in the direction of the stream, is now put into rapid rotation, the resistance will be equal to the area of the entire circle of revolution, and it is found that the more rapid the motion the narrower may be the blade to give the maximum resistance.

The author then relates some experiments tried with screw propellers, applied to a small steamboat, in order to corroborate this theory.

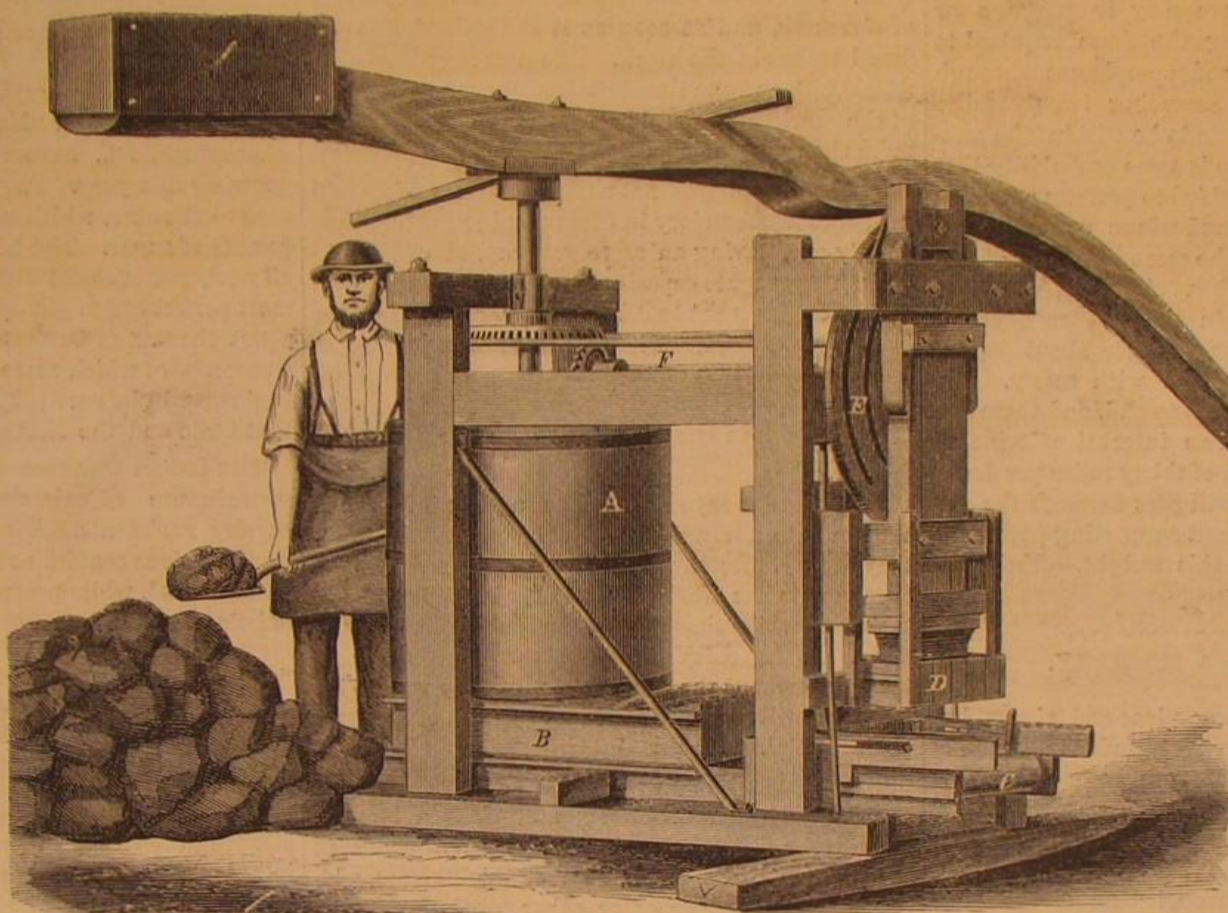
When the boat was moored fast, with the engine running at its utmost speed, but very little tractive effort was indicated, as nearly all the power was consumed in "slip," or in giving motion to a yielding body of water; but the boat was allowed to run onward, and the screw

are quoted, which show that a force of from three to four horse-power is required for each 100 lbs. raised in the atmosphere by means of a screw or windmill, rotating with its axis set vertically, and the author concludes from these experiments that any machine constructed on this principle, for raising or transporting heavy bodies, must end in failure, as we have no continuous motive power sufficiently light even to support its own weight.

The author next makes some observations on the flight and wings of birds, and points out that endurance of flight and sustaining power, when the bird is traveling rapidly through the atmosphere, is not dependent upon large surface, but on great length of wing, and among other examples mentions the albatross, whose endurance of flight is so great that in stormy weather it never rests on the water. The wings of this bird extend 14 feet from end to end, and only measure 10 inches across the broadest part; the sustaining effect is consequently obtained upon a very wide stratum of air, at a speed of 30 miles per hour. Taking this stratum at one foot thick it will weigh upwards of one hundred times as much as the body of the bird, and as the wings are constantly cutting into a fresh body of air with its inertia undisturbed, it affords a nearly solid support, even when the plane of the wings is set edgewise and parallel to the line of motion. Under these conditions the flight of the bird is performed with a less expenditure of power than by any other mode of animal locomotion taken at a similar speed.

In confirmation of this theory, the author alludes to the lee-boards and sliding-keels of vessels of shallow draught, which counteract lee-way and enable the vessel to carry a very heavy press of sail, so great is the resistance they meet against the rapidly

to find an abutment on a fresh body of water having its inertia disturbed; it acted almost as if in a solid nut, the slip being only 11 per cent, and the tractive power at its maximum. The author, after having given many other reasons for showing that the supporting effect of long and narrow planes moved edgewise through elastic and yielding media depends upon the width of stratum, and consequently the weight of material passed over in a given time, proceeds to consider how this principle may be applied to machines for sustaining weights on a support of air. If the proportions of surface and length of wing are taken from examples of the easiest flying birds, in order to sustain the weight of a man and the attachments, the wings must extend out 60 feet from end to end and be near four feet broad. This will at once show that such an arrangement would be utterly impracticable, and that no flying machine can ever be constructed in imitation of the natural wings of a bird. A spar or pinion 30 feet long must be very thick and heavy to bear the total amount of weight to be sustained, its forward edge would also cause great atmospheric resistance, needing more power than could well be spared for flight, and this cumbersome extent of wing would be productive of accident from contrary currents of wind near the earth's surface. The author shows that great length of wing is an absolute condition for performing flight with the least possible amount of mechanical force, and consequently that no machine can be successful if carried out in exact imitation of the wings of flying animals. But from the simple fact that a dozen pelicans, each weighing 21 lbs., may fly exactly one above the other without mutual impediment, as if framed in one, it may be seen that a weight of 250 lbs. may be supported in



WOLLISTON'S BRICK MACHINE.

a transverse distance of only 10 feet, or the extent of the wings of a single bird. On this principle various models were made, all of which, when held in a breeze, gave great supporting power for their size. The sustaining effect was found to be the same whether the planes were extended in one length, or superposed. A model was then constructed of sufficient size to raise the weight of a man. The plane surface was 18 inches broad, and consists of webs of thin holland stretched in a frame. The length of fabric was 90 feet, but, instead of extending in one length it was cut into five pieces, which were arranged equidistantly, one above the other, in parallel planes; the whole weighed about 45 lbs. This contrivance, when held against a breeze estimated at about twenty miles an hour, easily raised the experimenter, but not being provided with any propelling arrangement it quickly descended again, with no worse accident than the fracture of the apparatus. For the last six years other pursuits have prevented the author from continuing these investigations, and till very recently nothing further has been done. Experiments are now in progress for the purpose of ascertaining the force required to propel a series of superposed aeroplanes through the atmosphere, at speeds exceeding twenty miles per hour. Should this prove to be within the compass of manual power, there is some probability that an active man might be enabled to perform extended flights, as the system of fixed wings or aeroplanes may be very light, and at the same time abundantly strong for sustaining weights. An arrangement of planes, fitted together within the last few days for the purpose of experimenting, weighs about 40 lbs., and will bear a load of 3 cwt. with safety. The planes extend 10 feet from end to end, and there is a series of them in height, with an interval of 8 inches between them. At a speed of thirty miles per hour, six tuns of air per minute will pass through the apparatus, which will give great supporting power, by running on a stratum of this weight.—*Mechanics Magazine*.

#### MISCELLANEOUS SUMMARY.

A scientific way of lighting pipes and cigars has been recently introduced in Paris under the name of *poudre de feu*. It consists of pyrophorous, which is preserved in a small tin case with narrow orifice. When a little of this black powder is poured out on the end of a cigar, or on the tobacco in a pipe stem, and then gently breathed upon, it becomes incandescent, and is in a condition to light said pipe or cigar. What next? Why, there are little tubes sold containing pellets of potassium, and they are recommended to the juvenile Parisians as a means of forming splendid Gregorian fireworks on any convenient piece of water! Could Sir H. Davy see this he would be as much astonished as we should in seeing him.

THE Chicopee Manufacturing Company used during the year just closed, 5,872 bales of cotton, and made 9,007,325 yards of goods. The revenue tax of 6 per cent on sales amounted to \$110,863 36, or 26 per cent of the capital stock. Dividends of 45 per cent have been paid during the year. The company have purchased the water power of the Massachusetts Arms Company, at Chicopee Falls, adding a 15,000 spindle power to that previously owned by them.

CHEAP YELLOW GLASS FOR OPERATING ROOMS.—To some thick spirit varnish add a small quantity of iodine sufficient to render the varnish of the requisite deep color. When a glass is warmed, and a coating of the varnish applied, it will be found to be beautifully transparent. In the case of a globe for a lamp or gas it should be warmed, and a little of the varnish poured in and turned round before a fire till properly covered.

THERE are at present twenty-five grain-elevating warehouses in Buffalo, having a storage capacity of 5,495,000 bushels and a transfer capacity per day, of 2,616,000 bushels. Statistics show that more grain is handled at Buffalo than any other one point, not excepting Chicago.

THE manufacture of paper is about to commence in Oregon city. The machinery is on the ground and buildings are now in progress.

BUTTER MAKING.—A machine for making butter, just announced among the new inventions in the English Patent Office, consists of a movable metal cylinder suspended from a small cast-iron frame. The bottom of the cylinder is a loose piece of galvanized iron, and above this it is perforated by a number of small holes. This cylinder is suspended in a bowl of water, and the cream is placed in the cylinder and pressed by a screw piston, the result of which is that the butter is forced through the holes into the water, in the shape of vermicelli. By this means all the buttermilk is excluded, and the butter is found to be much closer and sweeter than when made by hand.

[It is not very clear how this excludes the buttermilk.—EDS.]

TUNNELING THE MISSISSIPPI.—The project of bridging the "Father of Waters," at St. Louis, has met with such strenuous objections that it has been abandoned, and the railroad companies, whose roads center there, have conceived the idea of tunneling the river. Consent to construct the work will be asked of Congress, and as soon as it is obtained, it is proposed to begin the work. The cost is estimated at \$3,000,000, and the time required for the completion of the work three years. The tunnel will not be more than three-fourths of a mile long.

In 1860, there was not a furnace or rolling-mill nor forge nor foundry in Cleveland; now there are twenty-one, having an aggregate capital of \$3,000,000, an aggregate capacity of 60,000 tuns per year, giving employment to 3,000 men, whose total wages last year, were \$1,080,000. There are in process of erection other iron and steel works which will increase the product nearly one quarter for the year 1866. The iron is all obtained from the Lake Superior mines.

AN exchange says that when a piece of iron is thrown into a trough where chickens drink water they are not affected with chicken cholera. A gentleman who has tried it, says that his chickens are thriving, while those of his neighbors are dying daily. As the chicken cholera is raging to some extent throughout the country, it might be well to try it. Iron will not hurt fowls, and a trial of it might be beneficial.

TO RENDER WOOD UNINFLAMMABLE.—Make a saturated solution of potash, and thicken it with paste as for distemper painting, then add sufficient clay to give it the consistence of thick cream, adding yellow or red ochre or other mineral coloring matter, if desired, for the sake of appearance. Wood painted with this composition is said to be proof against rain, and to be incapable of being inflamed, although it may be carbonized by a fierce heat.

THE Government authorities at Cologne have issued a circular cautioning the public against variegated slate pencils. Schweinfert green, which contains arsenic, is used for the green, chromate of lead for the yellow, and red lead for the red varieties. The circular points out the danger of this practice, especially to children, by whom slate pencils are chiefly used.

DURING five years ending with 1861, the carrying trade of New York amounted to \$1,644,000,000, over 1,000,000,000 of which was done under the American flag. In the four years which followed, out of the 1,700,000,000 of foreign trade of the city of New York, 1,300,000,000 was carried under foreign flags.

THERE are in the United States about nine hundred railroad corporations that operate steam-power roads; the joint length of the steam-power roads in the United States is about 32,000 miles, and their joint cost is about \$1,280,000,000—equal to an average of \$40,000 for each mile.

ENGLISH locomotive builders have adopted a method long in use on marine engines for fitting up certain connections. On the parallel rods of locomotives they use a solid bush instead of the usual box, and gib, and key. When the bushes are worn out others are supplied. This plan has been introduced on the New Jersey Railroad, and makes a very neat-looking piece of work.

THE burnt district in Portland has been accurately surveyed, and found to cover an area of three hundred and twenty-seven acres.

It is said that Mr. Gale, the discoverer of the process of rendering gunpowder non-explosive, has invented a contrivance for increasing the velocity of discharges from fire-arms. It consists of a longitudinal piece of steel, perforated for bullets, and fitting into a pistol between the stock and the barrel at right angles to the weapon. It is worked by the action of the lock and traverses a certain distance after each discharge. The device is not new. We saw it successfully applied by E. C. Kellogg, in Hartford, several years ago, to a rifle barrel mounted on a carriage.

THE sugar house of John B. Brown & Sons, at Portland, consumed in the recent fire, was one of the largest in the United States. The property burned was valued at \$700,000, on which there was insurance for about half the amount. This was one of the few establishments in the country in which refined sugar and sirup are made from molasses. The process is a secret very little known. It has been for many years a flourishing trade in Portland, conducted principally with the island of Cuba, and especially with Cardenas. Nearly four million gallons of molasses were consumed at this sugar house in one year. The works are to be rebuilt.

THE Beet Sugar Manufacturing Company, at Chatsworth, Ill., have six hundred acres of beets growing this year. They estimate the crop at ten tuns to the acre, which would yield full one million pounds of sugar. The machinery of the company is all new, was brought from Germany, and is in the most perfect order. They will commence operations about the first of October. If this enterprise proves a success—of which there is not much doubt—the business will be sure to spread with rapidity through that State and the Northwest.

THE Italian Government has given orders for the manufacture of cuirasses of aluminum for their cavalry regiments. A series of experiments made under various conditions demonstrate that a cuirass of this metal, while possessing the great advantage of being as light as a coat, cannot be pierced by a musket ball at the distance of forty paces, nor by the thrust of a bayonet. The war, however, so far as Victor Emanuel is concerned, having come to a sudden end, we presume he will not spend his money on aluminum cuirasses.

THE Pittsburg *Price Current* has seen a certificate allowing the use of steam of 183 lbs. per square inch, in a boiler that has been proved to the enormous pressure of 270 lbs. The boiler was built to test thoroughly the economy of high-pressure steam, five times expanded. The initial steam in the cylinder is intended to be 165 lbs. per square inch, and 40 indicated horse-power is calculated upon being realized with 60 lbs. of combustible per hour, or 1.5 lbs. per hour per horse-power.

FLY KILLER.—We have tried a great many plans to get rid of flies, but none has proved so effective as the fly paper made by Peck & Nash, of Bridgeport, Conn. A piece of this paper placed in a plate containing water, will invite the flies to a death banquet.

AT Lazell, Perkins & Co.'s works, at Bridgewater, Mass., a mold is being made for casting a monster sea water condenser for one of the Boston and Liverpool packets now being built at Newburyport. It will require twenty tuns of iron, and will be the heaviest single casting ever turned out by these works.

THE bricklayers of Memphis have struck work. They ask an advance of wages which will amount to seven dollars per day. The strike will have the effect of putting a stop, for a time at least, to many of the buildings now in course of erection in that city.

THE Michigan Central Railroad uses, and has fully tested and proved, the superiority of the six-wheel truck instead of four commonly used, and that in all casualties happening upon the road, no passenger inside of a car has been injured.

THE exports from the port of New York, for five months ending May 1, 1865, amounted to \$127,367,973, of which sum \$29,891,174 was in specie and bullion. The imports amounted to \$140,666,379—leaving a balance against us of \$13,298,406. Our tariff is now very high, yet we find a large party clamoring for free trade.

## THE CHILDREN OF MECHANICS.

The home is the center of human happiness, so far as happiness concerns our brief earthly life. Any thing that destroys home is inimical to happiness. Home, comprising wife, children, friends, with the domestic castle, is essential to the proper development of the best qualities of our nature and to the well being of all who have the least amount of civilized human feeling. The influences of home, more than the state of the market, the rate of wages, the condition of business, affect the workman. He can withstand the lowering of the price of his productions, the temporary depression of profits in his business, or the unforeseen fluctuations of the market, if he is sustained by the influences of home, and if he can be assured that his children can avail themselves of advantages which will enable them to retain their position and provide for themselves and those dependent upon them when he shall have left them. Then the future is humanly secure—for the present he can provide.

But what if there is a perpetual struggle at the present, with a gloomy uncertainty of the future. The man is deprived of all his vigor of mind, his enterprise, his pride. Yet such is the condition of thousands of industrious men in England. A correspondent of the *Pall Mall Gazette*, who has visited some of the iron furnaces in the "black country" of Staffordshire and Worcestershire says:—

In the mills and forges boys of all ages, from eight and upward, may be found, amid the labyrinth of machinery and the coils of heated iron, engaged by day and night in tugging long, red-hot seething bars. Their activity is very great, owing to the nature of their work, which requires rapidity of movement, and contrasts strangely with their otherwise jaded and worn appearance. In addition to the labor of dragging along the iron, each of these little fellows has to run, in short stages, a distance of more than eleven miles every day, in an oppressive atmosphere, thick with dust and steam. Owing to the quick and uncertain movements of the hot iron bars in their passage through successive rolls before having time to cool, the occupation of these boys is attended with some danger—a serious burn being an almost every-day occurrence.

Standing in the midst of an extensive forge, a few years ago, I was alarmed by a cry of terror at the further end of the works. There was a general rush to the spot, and I shall never forget the horrible and sickening sight that met our view. A large rod of seething iron, in coming from the rolls, had somehow twisted aside, and had literally pierced through the body of a little fellow some ten years old. For a while the roar of the machinery was suspended, and two or three brawny puddlers carried the hapless creature home; but when the first thrill of horror had passed away the wheels were again set in motion and all went on as before.

The lives of these boys are almost entirely spent in the forges, except the hours allotted to sleep. They have their meals there, and in the snatches of leisure it is their play-ground. In most of the works is the arm or basin of a canal, the water of which is kept in a state of chronic fever, and in which, despite its inky color, they delight to bathe, both in winter and summer. So constant are they in their ablutions that they often come out parboiled, like a washerwoman's thumb. Some of the proprietors of these works have provided night schools for the instruction of the children in their employ; but, as a rule, they are in mind and body alike neglected, and the densest ignorance prevails. They have no home training, most of their houses being locked up all day, the parents and all the children being out at work; and returning home fatigued at night, nothing but bed or a carousal in the "Fox and Dragon" is acceptable.

Returning home late one evening, I saw two little children, a boy and girl, lying asleep upon a door step, which proved to be that of their own home. On awaking them they told me that they were waiting for their mother to come out of the neighboring tavern, and open the door. They had no father and had been hard at work all day. The boy worked in a forge, the girl in a foundry, and the mother in a japanning factory, and though thus separated all day, there seemed no bond of affection to bind them when they met together.

In such a state of affairs there can be no legitimate home influences. The father and mother, all the children whose infantile strength can be utilized, are employed at hard labor, day after day, and week after week, too wearied, after performing their allotted task, to exert themselves to make home happy. Life to them is an endless and exacting treadmill. The gentler virtues, which give a charm to feminine character, make childhood loveable, and

civilize and elevate coarse, masculine humanity, cannot grow in such sterile soil. What do our mechanics think of such an exhibit as the following:

West of Dudley is a strange wild region known as the "nailing district," composed of scattered hamlets, to all the houses of which is attached what appears to the stranger a blacksmith's shop. The manufacture of wrought nails is, and has been for a century or more, the great staple industry of the district. It is carried on by the nailers in their own houses. In few trades of the district does the employment of women and young children assume a more objectionable form than in this. The women seem to have lost all traces of the modesty of their sex, and from childhood are addicted to swearing and smoking—resembling as far as possible the other sex in their habits and deportment even to the wearing of their coarse flannel jackets. They mostly marry very young, often at fourteen, and seldom later than eighteen or twenty. With such women for mothers, it is not difficult to judge of their children. From tenderest ages, often from five or six years, they are trained to that round of labor in which their lives are doomed to be spent. The first stage is "blowing the bellows," and next they are taught to forge the smaller kinds of nails.

The hours of labor are dreadfully prolonged, often exceeding sixteen hours per day; the rate of remuneration is very low, and the houses are consequently wretchedly poor. Entering one of them lately, I saw the father, mother, and eight sons and daughters, all toiling in a small ill-ventilated dirty hovel. It was growing late in the evening, and I inquired, "Is it not time to cease your day's work?" "Oh, no maister," rejoined the mother; "we've a noit's work afore us yet, or there'll be no bread o' the loaf o' Sunday." It was Friday night, and it was, as I learnt, a practice to work from Friday morning until Saturday afternoon, without having more than short snatches of rest for meals. While I lingered, a little fellow, who could not have been more than eight, fell from his work, apparently exhausted, but his father, on observing it, threw at him a hammer handle, telling him with an oath, to recommence his work. He took no part in our conversation, having, like his two eldest daughters, a short pipe in his mouth, which seemed to him and them "the calumet of peace."

American mechanics and laborers should feel grateful that neither they nor their children are consigned to such a hopeless and dismal slavery as this. The child of an American mechanic is treated as a child until it has assumed the virility of manhood. Home influences, schools, good air, God's glorious sunlight, and freedom, educate the child into a character above that of a human brute. These influences are absolutely necessary to the development of a rounded, manly character. Home is the primary school for such education, and when it cannot exist with a proper provision for its inmates, it is proof positive "there is something rotten in Denmark."

[For the Scientific American.]

## THE STEAM ENGINE INDICATOR.

Perhaps nothing connected with steam engineering of such acknowledged importance receives so little attention among builders and owners of steam engines. Its use to the constructing engineer is of the most vital importance. Without it he works in the dark. His engine may be well and properly proportioned, yet hidden defects may exist in the steam passages by the falling or washing of cores which reduces or distorts the passages, yet are not easily detected by the eye.

The writer remembers during a somewhat extended experience many instances of this. In two cases he has found the exhaust passages entirely closed, and yet it was not detected until the engine had steam on it and an attempt was made to have it move. Other cases have come under his notice where the passages have been but partially closed—here the indicator reveals it at once. The writer knew of an engine 16×40 inches made by a popular firm for a party to put in a large building for the purpose of supplying power to tenants. The machine was got up with great care from new patterns, and being in a good location to show, it was intended as a model engine by the makers.

It proved to be, however, a very expensive machine to run. New and improved boilers were put in but without materially reducing the amount of fuel consumed. The engine was overhauled repeatedly by the makers, who did everything within their knowledge to improve it, but without effect. The power generated cost too much. The landlord lost money and failed; the same result followed his successors,

and finally the engine was thrown out and its place supplied by another with good results to the owner of the property.

The old engine was offered for sale, and sold to go in an armory in an adjoining State. It was overhauled and put in good condition so far as could be seen, and put at work, but with the same result—a large consumption of fuel for the power available. After all other expedients had failed, the indicator was applied, when it was found that with an initial pressure of 60 pounds there was a back pressure of 15 pounds! Here, then, was revealed the cause of the trouble. On examination, the exhaust passage was found obstructed; the cores had not met properly, and the exhaust steam had to pass through an aperture of about a square inch in area. On cutting through the side pipe and removing the slight obstruction the engine performed a duty due to the fuel consumed.

On another point of great importance to the well working of the steam engine the indicator is invaluable—the setting of valves. Most engineers think they can set their valves by the eye, but an experience, somewhat extended, with the indicator has shown the writer that as a rule this is a fallacy; valves have to be set by the eye when the engine is not under steam, hence the expansion, the springing of the various parts, which cannot with certainty be ascertained, consequently it is seldom that they are right. The indicator, then, is the only way known by which valves can be perfectly adjusted.

Until the year 1862, the instrument in use previous could not be used on engines of quick motions with any satisfactory result. At the great exhibition of that year, in London, an indicator was exhibited, invented by Mr. Charles B. Richards, of Hartford, Conn., by which diagrams, correct and entirely reliable, are taken under any attainable speed; hence locomotives and any other quick-running engines are indicated with equal accuracy as the large slow-moving marine engine.

Another important fact is proved by the indicator—the exact amount of power exerted by the engine; this, compared with the fuel consumed, enables the engineer to compute with exactness the cost per horse-power, also the quantity of power used for certain work or by different tenants. About this there is no guess-work; it is absolutely weighed and measured.

The custom of renting power by a belt of given width and velocity is fallacious. It is easy to tell what power a belt should transmit, yet it is utterly impossible to tell how much it will transmit; so many contingencies arise, some of which follow the quality and condition of the belt, the condition of the pulleys, the amount of contact with pulleys, the position—whether vertical, horizontal, or diagonal; which side is the draft on; whether the grain or flesh side is in contact with the pulley, the tension, the condition of the atmosphere, etc. The only reliable mode is to measure the work by the indicator. By it we can ascertain the comparative value of different kinds of fuel, also of lubricants, the ability and faithfulness of the engineer and fireman. In fine, all elements which assist in making and using steam efficaciously and economically.

F. W. B.

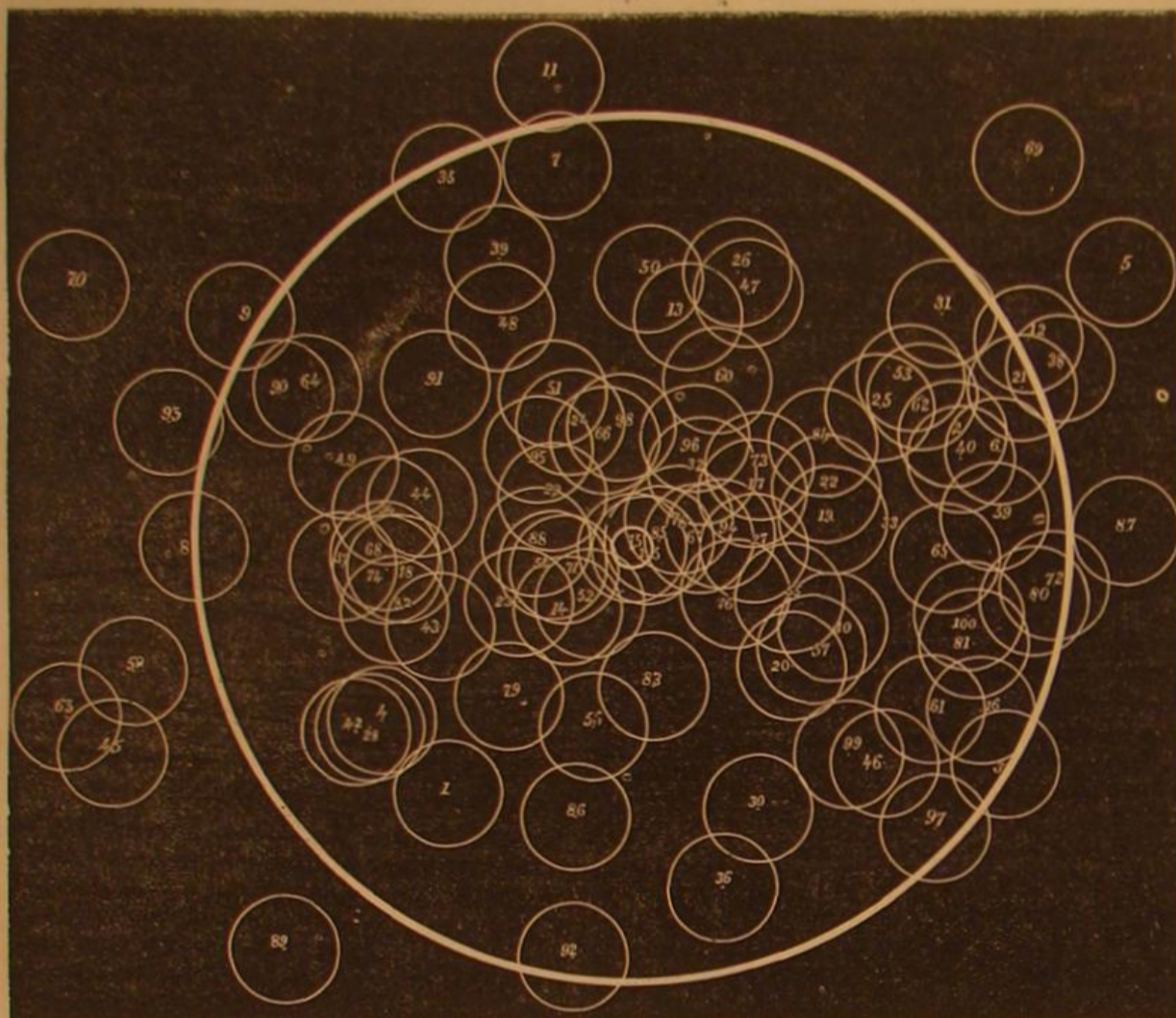
**LARGE INDIA-RUBBER BALL VALVE.**—Some india-rubber ball valves, five inches in diameter, have recently been manufactured by the New York Belting and Packing Company. These are the largest valves of the kind made in this country, and are preferable to brass by reason of their noiseless action, uniform tightness, and lightness.

THE Secretary of the Treasury, upon a question submitted to him, has decided that iron, whether imported or domestic, to be used in the construction of steam boilers for vessels, must be stamped in the manner required by law, otherwise the makers or users will be subject to a penalty.

It is stated that the method of protecting gunpowder by mixing it with ground glass, patented in England by Mr. Gale, is of no practical utility, as the sharp particles of the glass cut the grains of the powder and reduce it to meal in the process of separating the two substances. This report lately appeared in a foreign journal.

**Rifle Shooting.**

Mr. L. H. Simmonds, of San Francisco, Cal., has sent us a lithographed diagram of a target recently shot at in that city. The distance was 40 yards and the marksman was Dr. E. H. Pardee. The diameter of the bull's eye was 4 inches, and the string made from the center of the bull's eye to the center of the bullet hole was 131½ inches. The Doctor's worst shot measures 21½ inches from the center of the bull's eye. The engraving published herewith shows the target as it appeared at the end of the contest.



Facts are wanting in this statement to make it perfect. These are, whether the shots were fired off hand, what kind of a rifle was used, whether a target rifle with telescope sight, or an ordinary one; also, what the force of the wind was and its direction with relation to the target. Correspondents should endeavor to give all the facts when writing for publication.

**An Immense Temple of the Muses.**

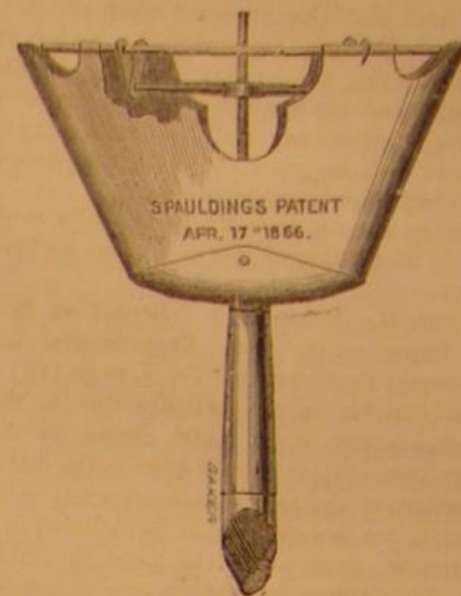
Louis Napoleon is building in Paris the largest structure of modern times designed as a place of amusement. It is an opera house which will rival in extent and grandeur the Coliseum at Rome. It will cost about \$5,000,000, and will be constructed entirely of stone, brick, and metal. Nothing combustible will enter into its composition. It will cover seven and a half acres and be two hundred feet in external height. The auditorium, however, is calculated to seat only about three thousand persons. Every box will have its separate saloon attached, fitted up like drawing rooms, and a carriage way will be constructed to the second story from the street. The most successful and celebrated artists of France—painters, sculptors and architects—will be employed in its ornamentation and erection. It will be entirely unapproachable in finish and richness by any structure at present existing.

**Removing Hyposulphites.**

The last traces of hyposulphites of soda can be eliminated from paper pictures by means of electrolysis. The method is due to Dr. W. Reissig, of Vienna, and consists in placing the proofs between two sheets of metal, binding them together, and passing the current from a Bunsen's battery through them. The delicacy of this way of detecting minute traces of hyposulphites is well known, and I hope its application to the decomposition of the deleterious salts will be found practicable. The manipulations required will not be at all difficult—far less so than rolling a number of proofs. Without previous trial,

I should suppose a good way of proceeding would be to place a sheet of polished metal at the bottom of a shallow dish, and attach to it a wire proceeding from the positive pole of a battery. On the metal arrange a number of well-washed prints, and upon the prints place another sheet of metal connected with the negative pole, cover the plates with distilled water, and let the current pass. I do not think the plates need to be made of silver. Metal that coach-lamp reflectors are made of, composed of silver and copper rolled together in varying proportions, would probably be found to answer. The first cost of this

improvements. The head is formed of metal, and is attached to a metallic shank for the reception of the handle. The shank carries a screw which passes through a cross bar, to the extremities of which are attached arms pivoted to stiff wires in the web of the metallic case, at the lower edge, forming a toggle joint. By turning the shank to the left these arms are released, and the shell is allowed to expand, when it can be filled by the broom. Then the shank



is turned to the right, screwing up the arms and contracting the sides, when the broom is clamped tightly between the sides of the shell. It seems to be a very efficient device for the object sought.

Patented April 17, 1866. Manufactured by Lakin & Hall, sole agents, Brodhead, Wis., to whom all orders should be addressed.

**The Queen's Portrait for Mr. Peabody.**

Photography is, we understand, chiefly employed as the aid in producing the portrait of Her Majesty to be presented to Mr. Peabody. It is entrusted to Messrs. Dickinson, of Old Bond street. Though only half-length, the painting is 14 inches long by nearly 10 inches wide. For the first time, for the presentation of her portrait to a private individual, Her Majesty sat in the only robes of state she has worn since the death of the Prince Consort—the costume in which she was attired at the opening of the present Parliament. This was a black silk dress, trimmed with ermine, and a long black velvet train similarly adorned. Over her Mary-Stuart cap is the demi-crown, while the Koh-i-noor and one rich jeweled cross, presented by Prince Albert, form her only ornaments. To complete this portrait, Her Majesty gave Mr. Tilt several long sittings, and has now expressed her unqualified approval of the water-color shown at Mr. Dickinson's. This, however, is but the commencement of the process. The portrait is to be done in enamel by Mr. Tilt, on a panel of pure gold. In these enamel paintings, to bring out all the brilliancy of their colors, they have to be burnt in a furnace at least five and generally six times. The heat to which they are subjected is so intense as to be only short of that which would fuse gold, and the most exquisite care is necessary neither to let the picture heat too soon, nor, above all, cool too rapidly, as in either case the enamel would crack. So large an enamel portrait has never been attempted in this country. After being submitted to the Queen on its completion, it will be forwarded to Mr. Peabody, who intends to deposit it where it may be best seen in a large institution which he has founded in Boston, his native town.—*Photographic News*.

[The *News* is mistaken in the place of Mr. Peabody's nativity. He is a native of Danvers, Mass.—[Eds.]

THE New Haven *Courier* says that during a recent thunder storm in that city, an old hoop skirt, lying in the middle of the street, caught the electricity, and in spite of rain falling at the time, burned and smoked away all there was combustible about it.

THE Paterson (N. J.) *Press* says that the falls are destined to be almost entirely done away with, under the constantly increasing demand for water power from the mills.

**SPAULDING'S PATENT BROOM HEAD.**

Many of our farmers raise broom corn, and they have been in the habit of utilizing such portions of the product as did not find a ready market, by forming it into brooms which serve a temporary use. In



this they have been assisted by our inventors, who have contrived receptacles for the broom, so that it was an easy matter to construct an efficient implement for the practice of the virtue "next to godliness," and still preserve the head for another reception of broom corn.

The engravings annexed show one of these im-

## A STRANGE INCONSISTENCY.

Toward the close of 1862, the Chief of the Bureau of Steam Engineering conducted a series of "dock races" with the machinery of the original monitor. His summation of the result is, that "the great cylinder condensation should be decisive against the use of this type of engine." This, he states, is due to the peculiar construction of the cylinders. His reasoning—the prelude to his condemnation of the engines—is so remarkable, and so totally at variance with well-established facts in relation to conduction and radiation of heat, that it has attracted much attention in our mechanical cotemporaries abroad. No less an authority than John Bourne has recently, in the *Engineer*, expressed his surprise at the absurdity of Mr. Isherwood's deductions. But the inconsistency of Mr. Isherwood with his own reasoning and deductions, seems to have escaped attention.

The following extract from Mr. Isherwood's work are so clear in illustration of this point that we give them below:

Extract from Mr. Isherwood's "Report on Erie Expansion Experiments" (see "Experimental Researches in Steam Engineering," Vol. 1, page 110.)

"The condensation in the cylinder due to the variable temperatures of its metal, caused by the alternate exposure of its interior surface to the different temperatures of the steam on the opposite sides of the piston, is too insignificant to be included in a practical estimate, even under the most favorable conditions. The surfaces in question are, of course, the sides, ends, and nozzles of the cylinder, the interior of the valves, and the disk of the piston. To understand how very small the condensation due to this cause must be, we will consider the conditions of the simplest case, namely, that which occurs when using the steam without expansion. For this purpose, let us suppose the piston to have just arrived at one end of its stroke, and the whole interior of the cylinder to be filled with steam of the boiler temperature, and its surfaces, to a certain depth, to have the same temperature. Now, let the exhaust valve be opened, and then this steam will be discharged into the condenser and replaced with vapor of the greatly less temperature of the back pressure. This vapor will, of course, absorb heat from the metal of the cylinder, but the maximum quantity can only be that which would raise the temperature of the cylinder full of back-pressure vapor to nearly that of the metal; and if we consider the extreme tenuity of this vapor, the trifling weight of a cylinder full, and the difficulty with which it absorbs heat, we shall appreciate how little will be taken up. In the practical operation of the steam engine, the cylinder full of back-pressure vapor is pushed out by each stroke of the piston into the condenser, and, of course, carries with it whatever heat it had obtained from the metal of the cylinder by contact and by radiation. That the quantity, however, is practically inappreciable, will appear from an examination of the experiment made with the steam cut off at eleven-twelfths of the stroke of the piston from the commencement, in which the whole difference between the weight of feed water pumped from the tank into the boilers, and the weight of steam accounted for by the indicator, is only 2.91 per cent of the former.

In this slight discrepancy is, of course, included the loss from every kind of leakage, and from the condensation by external refrigeration in the steam pipe, valve chests, and cylinder. Slight as the loss from this particular cause is seen to be when using the steam without expansion, it will be still less when the steam is used expansively, decreasing as the measure of expansion is increased; for as the temperature of the steam urging the piston will continue to fall from the point of cutting off, to the end of the stroke, whatever heat the steam of reducing temperature obtains from the metal of the cylinder, previously imparted by its higher temperature, before the point of cutting off, will be utilized in producing a dynamic effect upon the piston, and the temperature of the metal will, to that degree, be made lower for the back-pressure vapor to act on and which will, therefore, obtain less heat from it."

Extract from Mr. Isherwood's "Report on his Experiment with the Engines of the monitor. (See same Vol., page 339.)

"From the description of the monitors' engines, it

will be perceived that the two cylinders occupy the same barrel, the separation being made by a simple partition of cast iron in the center. Further, that during a large portion of the time, the boiler steam occupies one end of one cylinder, while the adjacent end of the other cylinder is open to the condenser. There is, consequently, one end of one cylinder maintained at the temperature of the boiler steam, while the adjacent end of the other cylinder, separated only by a cast-iron partition, is exposed to the temperature of the condenser. This arrangement, immaterial as it appears, and is, in a mechanical point of view, powerfully affects the economic result by its great influence on the cylinder condensation. To appreciate it, it is only necessary to imagine the piston of the starboard engine, for example, to be near the outboard end of its stroke, in which case nearly the whole of the cylinder of that engine will be filled with steam. At this moment the piston of the port engine is near the center of its stroke, and about one-half of the port cylinder adjacent to the starboard cylinder will be open to the condenser, and exposed to its refrigerating influence; consequently, the boiler steam in the starboard cylinder has been exposed for about one-half of the stroke of its piston to this refrigerating influence from the port cylinder, transmitted through the iron partition of the two cylinders, which, as their diameter is great in proportion to the stroke of their piston, forms a large proportion of the surface in contact with the steam. Nor does the evil end here, for as the sides of both cylinders are the same piece of iron, those of the one being merely an extension of those of the other, the conduction of heat is very rapid from one cylinder to the other, and the heat imparted by the steam to the sides of the starboard cylinder, quickly passes along by conduction to the sides of the port cylinder, whose interior is in communication with the condenser, and whose exterior is exposed to the atmosphere; the inevitable result, it is manifest, must be a largely-increased steam condensation in cylinders of this type of engine over that in the cylinders of engines of the usual type; how much larger; is a question which experiment alone can answer."

From the above extracts it has been seen that Mr. Isherwood has stultified himself, and that, too, in the same book. Was this because he had certain theoretical views to sustain, which are inconsistent with the results of his final experiment? It seems that the object in the latter experiment, was to condemn a certain style of screw engine.

A comparison of the extracts we have given, not only casts a strong suspicion on the honesty of Mr. Isherwood's reasoning, but of far greater importance, it suggests a grave doubt with respect to the truthfulness of the numerous experiments in the two official volumes alluded to. We make these remarks with great regret that they are called for by the premises. But when it is remembered that these coal-burning experiments have cost thousands upon thousands of dollars of the public money, it is very unfortunate that their accuracy should be questioned, or that any should say they were made to establish certain theories. The bare suggestion is enough to seriously impair—if not to destroy—any value which it is possible they might otherwise possess.

Still further, the Chief of the Steam Bureau, it seems, was so anxious to condemn the successful engines of the *Monitor*, that he did not even scrutinize them sufficiently to ascertain how they were made. He asserted, for example, that the two cylinders "have but one bottom in common." On the contrary, they have a separate bottom to each, with a space between them. As the two bottoms are in juxtaposition, of course, radiation is effectually prevented. A great deal more, and to the point, could be said on this subject, but we leave it as it stands, for the present.

PER SE.

## Silicated Whitewash.

M. Ch. Guerin called the attention of the French Academy to a new method of obtaining, by a cold process, a silicate completely insoluble, which can be applied either as an external coating, as in the case of glass or iron, or made to penetrate through the interior of the substance, as for the preservation of wood and other vegetable matters. The process is very simple: a thin coating of slaked lime made

into a paste with water, or whitewash, is laid on the object to be silicated, and when this has been allowed to dry, silicate of potash is applied over the coating; the effect, it is asserted, being that all the portions touched by the solution of potash become completely insoluble, and of very great adherence. In order to obtain an insoluble silicate in the interior of a substance, all that is necessary is to impregnate it by immersing it in whitewash, or lime water, and when it is dry to steep it in a solution of the silicate of potash.

By this means it is proposed to prevent the decomposition of vegetable substances by petrifying them; also to protect porous building stones and brick against air and damp; iron, by a coating of paper, pulp or other finely-divided woody matter mixed with slaked lime.

Again, letters, characters, or any other device can be traced with the silicate on any surface spread with lime, and those portions touched by the silicate will alone adhere and become insoluble. Or, if they be traced with a solution of gum arabic, and the whole be washed over with the silicate, the parts protected by the gum can be washed off, the rest remaining in relief, as the letters, etc., do in the first place.

The process seems to be substantially the same as the English process, known as Ransome's.

## Useful Recipes.

PURE, inodorous glycerin will completely absorb the odors of flowers, if you submit them to a digestion for several weeks in a well-closed jar, and in a moderately warm place. The flowers should be covered by the glycerin.

CHLOROFORM removes stains from paints, varnishes, and oils. Another very effective fluid for the same purpose, is a mixture of six parts of strong alcohol, three parts of liquor ammonia, and a quarter part of benzole.

A GOOD white enamel for earthenware may be prepared as follows:—Melt and oxidize 60 lbs. of pure lead, and 40 lbs. of pure tin; 100 lbs. of this oxidized metallic compound should be melted with 50 lbs. of fine white sand (free from iron), 50 lbs. of common salt, 20 lbs. of powdered feldspar, 6 lbs. of nitrate of potash, and 6 lbs. of litharge. Grind the melted enamel finely in a mill and apply it to the ware.

For filling cracks in wooden furniture try the following cement:—Moisten a piece of recently burnt lime with enough water to make it fall into powder; mix one part of the slaked lime with two parts of rye flour, and a sufficient quantity of boiled linseed oil to form it into a thick plastic mass.

THE following recipe for a transparent pomade we copy from a foreign periodical:—Dissolve ten grains of Chinese gelatin by boiling in one ounce of distilled water, and remove the impurities swimming on the surface; mix this solution with four ounces of warm glycerin perfumed by five drops of oil of bergamot, or three drops of oil of roses, and colored by extract of rhatany. The mixture, when cold, should be tried by rubbing between the hands whether it will melt or not. If it should be too stiff, then warm it up in a water bath, and add to the fluid compound a small quantity of glycerin and let it cool; but if it proves to be too soft, add one to two grains of gelatin, previously dissolved in water. Heat the pomade to a temperature of 40 deg. Cent., and pour it into glass vials, where it will become stiff and transparent.

BEDBUG POISON.—In a pint of strong decoction of quassia, dissolve 60 grains of corrosive sublimate, and two drachms of muriate of ammonia. Label accordingly.—*The Druggists' Circular*.

LIQUID BLACKING.—Boil one ounce each of powdered galls, starch, and copperas, and two ounces of white Castile soap with two quarts of water, then strain and mix with three ounces of fine ivory black, and six ounces of molasses.

SOLVENT FOR OLD PUTTY AND PAINT.—Soft soap mixed with a solution of potash or caustic soda; or pearlash and slaked lime mixed with sufficient water to form a paste. Either may be laid on with a brush or rag, and when left for some hours will render its removal easy.



### Clay vs. Iron Gas Retorts.

MESSRS. EDITORS:—Can you inform me why iron retorts are still used in the gas works of this country? It is a well-established fact that fire-clay is not only more durable but, if made in a systematic manner, comes much cheaper than iron. I was connected with a clay-retort works in England and know that they have entirely superseded iron there.

CLAY RETORT.

Philadelphia, July 16, 1866.

[It is a matter of surprise to us that all large gas works have not adopted the use of clay instead of iron retorts, especially after informing themselves of what practice and experience has fully demonstrated both in this country and in Europe. In such gas works where the trial may not have resulted favorably, the result can only be attributed to defective setting or mismanagement, as they actually require less care in working them. It is only in very small works, which cannot, from their size, use an exhaustor, that clay retorts are not so well adapted. Yet there are many such who do use them profitably.]

At a meeting of the London Institution of Civil Engineers, a paper was read on the use of clay retorts in gas making from which we make the following extract:—

"The iron retorts, lasting 365 days and working 1½ cwt. of coal for each charge, effected the carbonization of 2,190 cwt. of coal, which, at 9,000 cubic feet of gas to the ton, gave a total quantity of 985,500 cubic feet of gas per retort, while clay retorts lasted 912 days, carbonized 5,472 cwt. of coal, which, at 9,000 cubic feet of gas per ton, gave 2,462,400 cubic feet of gas per retort."

"The most practical working of clay retorts was with the addition of an exhaustor. This reduced the pressure on the retorts, and prevented the escape of gas through pores and fissures, and by that system, the quantity made was increased about 200 feet per ton of coal."

In the discussion the general results given in the paper were confirmed. It was, however, stated that the quantity of gas obtained from iron and from clay retorts must be in proportion to the quality of the coal used. In some places where 7,600 cubic feet of gas had been produced by iron retorts, as much as 9,200 cubic feet had been made in clay retorts, and the production had been as high as 11,000 cubic feet.

There are now, we believe, in the vicinity of this city three clay-retort works whose products are nearly, if not quite, equal to those formerly obtained from Europe.—EDS.

### Pressure in Boilers.

MESSRS. EDITORS:—Your correspondent who inquires why his boilers fail to stand the pressure required, was properly answered so far as his queries and statement went. There is one important point which he does not state. That is, the size of his grate surface and the area of the passage between the bridge wall and shell of the boiler. The area of the flues would warrant a grate surface of 36 feet. The area of the passage over the bridge wall should not have been less than 1,200 square inches. There is a vicious habit, attending boiler setting, in making this passage too small, thereby concentrating the intense heat of the furnace in front and over it, thereby heating the plate so hot as to make globules of the water in contact, hence destroying the plates. I think the whole trouble will be found, if we get the facts in the case, in a contracted passage at the point mentioned.

F. W. B.

New York, July 9, 1866.

### Home-Made Aluminum.

MESSRS. EDITORS:—Being in want of some aluminum, I overhauled (as usual in case of a want) some two or three back volumes of the SCIENTIFIC AMERICAN, but only found a brief note in a recent number; acting, however, on the suggestions, I procured a lump of alum, dissolved, added soda, and to the washed precipitate added muriatic acid; to this solution I afterward added aqua ammonia, expecting

to see a metallic precipitate; but got only a pasty mess, which yielded alumina before the blow pipe, with no trace of anything like metal. Will you please put me right?

If there is any practicable method of obtaining the metal at a cheap rate, I think many of your readers would prize the information.

AR. IND.

[The brief note to which Ar. Ind. refers, explained how to produce alumina, a very different thing from aluminum. The metal cannot be produced at a cheap rate.—EDS.]

### Questions for Millers.

MESSRS. EDITORS:—I have been reading your paper for some time, and find there is a great deal of information to be gained from it. I wish to gain a little upon a point I have not yet seen discussed in its columns. I am at present running a steam flouring mill at this place, and have some trouble in keeping the bush of one of my burrs in order; it is a cast bush, with wooden followers, burr running with belt; I wish to know where the pull on the bush is—whether directly in front of the power, or at some other point. I wish to know this in order to set my followers in their proper position.

I also wish to know why the composition boxing, as it is generally used about engines, has not been adapted for bushing—if it is good at one place why not at another?

H. C. WILKINS.

Bloomington, Ind., July 6.

### Personal.

We understand that Congress proposes to establish a Commission of Education, for statistical and other purposes. It is an excellent idea, if it falls into right hands. We have heard the name of Alfred B. Ely, of Massachusetts, suggested in connection with the place. No better appointment could be made for the good of the country, and we hope the suggestion may be carried out in good faith. We have known Mr. Ely for several years, and feel assured that he would bring to the office ripe experience, large attainments, and great force of character, and qualifications which would insure both popularity and success.

SPECIAL COMMISSIONER OF REVENUES.—Mr. David A. Wells, of the present revenue commission, has been appointed to the office of Special Commissioner of the Revenues, created by the new Internal Revenue act, from on and after the 1st of August next. The office is one of wide scope, and Mr. Wells is necessarily invested with great discretionary power in investigating frauds and bringing offenders to justice. For a year past Mr. Wells has devoted himself assiduously to the interest of the Revenue Department, and his appointment to the new office is a well-merited compliment and reward.

### The European Squadron.

Our present force in European waters amounts to twelve vessels, carrying 141 guns. But it is thought that should the existing war between Austria, Prussia and Italy continue for any length of time, this force will require to be largely increased in order to afford adequate protection to American interests in that quarter. The splendid new steam frigate *Chattanooga* has been assigned to duty in the squadron of Admiral Goldsborough, and will sail for Europe as soon as her outfit is completed. The *Chattanooga* will prove a most valuable acquisition, being not only a very powerful vessel, carrying a heavy battery, but also a very swift one, having on her trial trip made an average of 15 knots an hour under unfavorable circumstances. Several other vessels are also spoken of as being designed for duty in Europe, among which we may mention the new sloops-of-war *Madagascar* and *Neshaminy*, both fitting for service at this port.—*Journal of Commerce*.

RATHER WARM.—Prof. Loomis of Yale College states that on the 17th inst. the thermometer stood at 102 in the shade at New Haven, and that the day was the hottest that has occurred for 89 years. We are thankful for this information, and trust that the same length of time may elapse before the return of another such spell. At Wheatshaf, N. J., the thermometer actually reached 104 degrees for a short time in the shade.

### THE HEATED TERM—HOW TO KEEP COOL.

It is probable, if not certain, that never in the history of this country, has a summer of such severity of heat as this been experienced. In our school-boy geography, we were told that the climate of the temperate zones consisted of "extremes of heat and cold." It is literally true. We have in winter polar cold, and in summer tropical heat. It is not an exaggeration to say that the temperature of the thermometer here during the first two weeks of July equals anything of the sort under the equator. Not only in large cities, as New York for instance, but in the country, that anticipated paradise to which the citizen flies on the approach of the warm season, the heat has been anything but temperate. Existence has resolved itself into the simple effort to follow the oft quoted advice, "keep cool," but how is it to be done? We have a few advisory suggestions to make, applicable, we are aware, not to all, but peradventure to some whose circumstances may make their adoption feasible.

1st—Diet. Eschew carbon-generating food, such as meats, rich cake, spiced dishes. Let alone crude substances which require a large draught on the force of the animal organism to prepare them for assimilation and absorption with the blood, as fresh fish, pastry, puddings, and rich soups. Eat lightly; only enough to keep the system in tone. Avoid repletion and over eating. Shun stimulants. Use ripe fruit freely, salt meats well cooked, fresh vegetables, bread, farina, moderately strong tea, no coffee, and but little ice-cold water.

2d—Condition of mind and body. Do not argue on politics, religion, or any pet hobby. Avoid scandal. Do not get angry, nor fearful, nor anxious. Don't fret. Don't arraign Providence, nor find fault with your neighbors. Cultivate patience, and a stoical calmness under provocation. Do not run, walk fast, nor get into a perspiration unnecessarily. Although perspiration may not, in itself, be injurious when provoked by a laudable endeavor, do not allow it to be suddenly checked by ceasing exertion and remaining passive in a cool place.

3d—Preventives. Wash the whole body every morning, and if convenient, at night, also. This can be easily done with a quart of water and a sponge or rag, or with the bare hands. Rub down dry with a towel. Apply a brush to the skin smartly, or a bit of hard woollen rag if you have not horse-hair mittens. Your body needs a surface glow as much in summer as in winter. Those who have a bathroom in their houses know the advantages of daily bathing, especially in summer. But a bowl of water is a good substitute. Change under-clothing every day if possible, if not as often as is practicable and convenient. Put in your ice-water a little spirit, or if you do not use ice, cool your water with a little tartaric acid. It is equal to lemon juice, and cheaper. A piece as big as a walnut put in a common bucket, or kept in the glass from which you drink, will give a delicious acidulated taste to the water, and increase its cooling properties.

To keep the house cool, hang up before your open doors or windows, or suspend in the draught across the rooms, blankets dipped in cold water and wrung out sufficiently to prevent dripping. This is an easy, simple and wonderfully effectual method of cooling rooms. Keep the door steps and pavement wet, and sprinkle water in your entry. Do not sleep on feathers nor hair mattresses. Straw, palm-leaf, or husks are preferable. Never sleep naked. Wear a woollen or gauze undershirt, and cover with a sheet. The sheet need not touch the body, but can be easily secured by the corners to the bed posts, leaving a space under its roof. It is a mistaken idea that entire nakedness is conducive to coolness. It is not so. Some material to absorb the perspiration should be worn next the skin.

These suggestions are drawn from an experience of years, and may be relied upon as worthy of at least one trial. The pivot upon which the whole turns is that of internal and external cleanliness, both of mind and body. A perturbed, anxious, excited mind, is as impure as a surfeited stomach or a neglected skin.

### Photographic.

Card groups, now much in favor at Vienna, are as follows:—It is a card of the ordinary dimensions, containing a group of seven persons, distributed

lengthwise on the card. It represents the interior of a drawing room, a paneled wall, chimney piece, etc., forming the background. Two of the figures are seated at a grand piano, playing a duett, while a third one turns over the music; a fourth, standing near, leaning on the chimney-piece, apparently listens to the music; a fifth sits with an embroidery frame on her lap, engaged at work; another sits before a writing desk, or Davenport, writing a letter; while another stands by with a letter in her hand, apparently in conversation with the last. The scene is simple and domestic; a family group at home. The grouping is admirably managed, the photography exquisitely perfect and delicate, at once excellent in definition, light and shade and pictorial effect.

Another new style is a full-length *carte-de-visite* portrait of a gentleman, front view, and on the back of the card is pasted the portrait of the same person, in the same position but taken from his back, and this being reflected in a little piece of looking-glass placed in front of the back picture, you see the whole of the gentleman at one glance, both front and back view.

### NEW INVENTIONS.

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

**STOVEPIPE DRUM.**—C. C. WEBBER, Calmar, Iowa.—In this stove drum are a series of flues to thrice convey the product of combustion from end to end. In connection with the central flue is an adjustable pipe, worked by a rod passing out of the top of the drum; by adjusting this a direct passage of products can be formed with the stovepipes, or by lowering it the circuit can be established.

**CLOTHES-WASHING MACHINE.**—PHILIP VAN BUSSUM, Henderson, Ky.—This invention consists in a novel construction and arrangement of the concave and the manner of applying the pressure thereto, whereby it is believed that a very simple and efficient washing machine is obtained.

**HOLLOW AUGER.**—J. H. SMITH, Pineville, Pa.—This invention consists of a frame or stock provided with an adjustable center rod, two adjustable jaws, operated by a right and left screw, and cutter.

**CULTIVATOR.**—ISAAC AVERY, Ottawa, Ill.—This invention consists in an improved draught attachment, whereby the device may be operated or drawn along by a moderate application of power, the plows moved either vertically or laterally, and the whole device placed under the complete control of the operator.

**STENCH TRAP.**—FRANCIS H. WILLIAMS, Syracuse, N. Y.—This invention consists in a sink, the interior of which is provided with an inclined apron extending over the edge of a tray in combination with a valve which closes the communication between the sewer and the tray in such a manner that water or other liquid poured down through the sink will fill the tray and then by forcing the valve open run down to the sewer, but as soon as the supply of water stops the valve closes down on its seat, and the water contained in the tray, together with the valves, prevent the escape of stench from the sewer through the sink.

This inventor has also secured another invention for a similar purpose, which consists in the arrangement of a siphon tube with a floating valve, in combination with the sink or waste pipes leading from the sink or sinks in a building and with a suitable pipe leading to the sewer in such a manner that by the liquid remaining in the lowest part of the siphon, and by the valve, the communication from the sewer back to the sink is firmly closed and the escape of stench from the sewer into the house or building is prevented, and at the same time the communication from the sink or waste pipes to the sewer is uninterrupted.

**STOVEPIPE DAMPER.**—B. F. COWAN, New York City.—This damper is a hollow spheroid and revolves within an enlargement of the same shape made in the pipe where it is used. The flattened sides of the damper and of the enlargement in which it revolves are parallel with each other, and are also open. The damper is suspended from points which are midway from its flattened sides, and its place of suspension in the pipe is likewise midway of the flattened sides of its enlargement, so that when their flattened sides coincide with each other, an opening is formed through the pipe and through the damper from side to side, and communication between the lower part of the pipe and the upper part is interrupted.

**TRUNK.**—LUTHER JACKSON, Newark, N. J.—This invention consists in the arrangement of spring stops on the ends of the inside cover or tray in such a manner that when the tray is opened it is retained by the spring stops, and not liable to close down spontaneously, to the great annoyance of the person packing or unpacking the body of the trunk.

**MUSICAL ATTACHMENT TO CAGES.**—G. GUNTHER, New York City.—This invention consists in the application of a music box to a cage, in combination with a suitable detaching lever and rod extending in the interior of the cage in such a manner that whenever the bird jumps or steps upon the rod or stop lever, the music box begins to play, when wound up, and an agreeable surprise to the persons in the room is effected.

**MACHINE FOR FLUTING WASHBOARDS.**—CALVIN J. WELD, West Wardsboro', Vt.—The object of this invention is to provide mechanical means for fluting washboards, and it consists in a novel construction of devices for feeding the boards to the cutters; in raising the carriage when it is moved back, so as to keep the boards from interfering with the knives; in the holders that

keep the boards in proper position while their flutes are being cut, and in the construction of the knives or cutters that produce the flutes of the boards.

**CASTER BOTTLES.**—BURROUGHS BEACH, West Meriden, Conn.—This invention consists in arranging within the bottle and extending in the direction of its length, a center shaft or spindle, having a series of radiating arms, in such a manner that without opening the bottle, it can be rotated therein, and thus by means of its several arms thoroughly pulverize the salt or other article in it, so that it can be freely discharged through its perforated cap.

**ARTIFICIAL HANDS.**—J. F. MAGUIRE, East Boston, Mass.—This invention consists in a novel manner of hanging the fingers and thumb to the hand, whereby they can be made to firmly grasp and hold articles of various shapes and sizes, and the fingers can be operated independent of the thumb.

**OIL WELL PUMP.**—W. E. MORRISON AND W. L. BETTS, Funkville, Pa.—This invention consists in attaching to the piston rod of the pump, above its upper valve, a cup-shaped vessel, perforated upon its sides and bottom, with its open end up. This vessel surrounds the rod, and is of a size to closely fit within the pump or well tube; and in the operation of the pump, it acts as a receiver for rivets or other articles falling through the well tube above it, by the presence of which heretofore much damage has been caused to the pump valves, etc.

**INVALID BED.**—HENRY CARDES, Belleville, N. J.—The object of this invention is to furnish an improved bed for hospitals, for use when the invalid is too feeble to be moved, in order to preserve the bed from becoming wet or soiled. It consists of a series of pipes, plane and concave plates, and a valve, combined with each other and with a bed or mattress.

**BURGLAR ALARM.**—R. M. WEBB, New York City.—This invention consists in so arranging upon the inside of a door, and with regard to the key hole of the lock in it, a device connected at its inner end with any suitable alarm that when a key is inserted in the door from the outside, or any tool used in the key-hole for picking or forcing the lock, the alarm will be instantly set free and sounded.

**CURING ROLLER FOR CLOTHES WRINGERS, ETC.**—J. B. FORTY, Roxbury, Mass.—This invention consists in curing a roller made of india-rubber or other vulcanizable gum on a hollow metallic core in such a manner that the heat is equally diffused throughout the entire mass of vulcanizable gum and the articles produced are of superior tenacity and toughness.

**LAMP CHIMNEY AND SHADE.**—J. H. CONNELLY, Wheeling, West Va.—By using a cylindrical glass chimney with a metallic cap piece, the durability of the chimney is greatly increased and liability to fracture by heat avoided. The cap piece is so formed as to constitute a most convenient means of applying the improved lamp shade to either the improved or common chimney.

**SUPPORTER FOR WINDOW SASHES.**—BURROUGHS BEACH, West Meriden, Conn.—This invention consists in a novel manner of operating the arms of the sash supporter, of that class having two arms hung upon a common center, whereby, when so desired, they can be both so swung or turned, and in conjunction with each other, as to be entirely relieved from the sash.

**CORSET SPRINGS.**—SAMUEL H. BARNES, New York City.—This invention consists in forming the springs of corsets of two or more thin metallic plates, placed one upon another, and so fastened together that they can move upon each other in the direction of their length, as the springs are bent, whereby their flexibility and elasticity, as well as durability, are greatly increased.

**HATS AND CAPS.**—CHARLES L. RAHMER, Brooklyn, N. Y.—This invention consists in a novel mode of securing the sweat lining within a hat or cap, for the purpose of allowing its interior to be ventilated when worn, while at the same time, the edge of the lining so secured, and which comes in contact with the head will readily adjust itself thereto, without being in the least degree inflexible.

### THE MARKETS.

The exports of specie from the port of New York since January 1st amount to \$49,363,133. For the week ending July 13, \$2,339,270. Gold has fluctuated considerably. On Monday, the 13th, it was at 148½ per cent., but next day it was 150 and above. The rate of interest was lower than before. Call loans are readily adjusted at 5 per cent.

**ASHES.**—Pots are quite dull, but with continued light receipts, prices are supported; the sales are a few small lots at \$3.25 to \$3.75. Pearls are unsettled, and offered at lower rates, but we hear of no business.

**BRICKS.**—Common Hard have advanced to \$10.50 to \$11.50. Croton and Philadelphia are unchanged at \$14 to \$15 for the former, and \$40 for the latter.

**CEMENT.**—Is in steady demand at \$1.75 cash.

**COFFEE.**—Laguayra, 17c.; Java, 21½c. gold, 32c. to 33c. currency.

**COPPER.**—Detroit, 33c.; Portage Lake, 32½c.

**COTTON.**—Fair demand. Ordinary, 25c. to 26c.; middling, 32½c. to 37c.

**FLOUR.**—Common brands, \$8.30 to \$10; Genesee extra, \$10.30 to \$13.50; Canada, \$8.70 to \$10.20.

**MEAL.**—Rye, \$6.75 to \$7.40; corn, \$4.75 to \$5.10.

**GRAIN.**—Corn, 32c. to 33c. medium Western; 33½c. to 34½c. extra; Oats, 30c. to 31c.

**HIDES.**—The market is dull, but prices are very firm. The sales are 1,900 Buenos Ayres, 21½c. to 23½c.; 600 Montevideo, 24 m., 18c. gold; 2,000 do., 21 m., 26c. currency; 5,347 Rio Grande, 20½ m., 16c. gold, 20 days; 200 Wet Salted do., 69 m., and 2,500 Texas, 24 m., on private terms.

**IRON.**—The market for Pig is quite firm, but there is not much demand at present, and the business is small; we only notice 300 tons Glengarnock Scotch, part at \$47, ex ship; small lots Glengarnock and arabelle, \$48 to \$50; and 100 tons No. 1 American, part for August delivery, \$48 cash. There is no change in prices of Bar from store, and the demand is light.

**LATHS.**—Are firm, with sales of 1,000,000 Eastern, at \$3.25, three months.

**LEAD.**—The market for Pig has become quiet, and, while the advanced prices are supported, yet it is scarcely as strong as last week; we notice sales of 300 tons Spanish and English at \$7.35 to \$7.50 gold; some choice brands of English are held at \$7.75. Bar, \$11.75, and Sheet and Pipe \$11.44 to \$100 lb.

**LEATHER.**—The market for Hemlock Sole continues moderately active, and prices remain very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33c. to 35c.; Middle do., 34c. to 35½c.; Heavy do., 36c. to 37c.; California Light, 31c. to 32c.; Middle do., 31½c. to 33½c.; Heavy do., 34c. to 35c.; Orinoco, &c., Light, 30c. to 31½c.; Middle do., 32c. to 33c.; Heavy do., 29c. to 32c.; Slaughter Upper in Rough, 31c. to 33c. Oak Sole is active at previous prices. French and American Calf Skins are in fair demand and firm.

**LIME.**—Rockland is in fair demand, with sales of 3,000 bbls. at \$1.50 for Common, and \$2.10 for Lump, cash.

**LUMBER.**—There is a good demand for Eastern Spruce, with sales of 465,000 feet at \$23 to \$25, usual terms.

**MOLASSES.**—Cuba (clayed and Muscovado mixed), 50c.; Muscovado, 52c. to 53c.; Demerara, 65c. to 75c.; Porto Rico, 68c. to 80c.

**NAILS.**—Cut, 6½c. to 7c.; Clinch, 8½c.; Forged Horse, 23c. to 24c.; Pressed do., 22c. to 24c.; Copper, 50c.; Yellow Metal, 33c.; Zinc, 20c.; and Ship and Boat Spikes, 7½c. to 8c. for 5 and 6 inch, and 7c. to 7½c. for 6½ and 8½ inch, net cash.

**SUGAR.**—Hard white, 16½c.; soft white, 15½c. to 15¾c.; yellow, 13½c. to 14½c. cash. Raw sugars—Cuba, 9½c. to 12½c.; Clarified Porto Rico, 11½c. to 14½c.

**WIRE.**—Telegraph, 9c. to 10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 18 covered, and 35c. for uncovered.

**WOOL.**—State and Western fleeces, 50c. to 60c.; pulled, 57½c.

**ZINC.**—9½c. less 4 per cent. for gold.



**J. U. R., of Pa.**—The largest monitor is the *Dictator*.  
**J. W. C., of Ill.**—Persons who preserve fruit and vegetables, acknowledge that green peas are very difficult to keep. We have seen specimens of what were called "fine," but they did not strike us as a success. Perhaps some of our readers will tell us the best way.

**W. J. W., of Ill.**—We published a recipe scarcely a month ago to prevent dampness on brick walls.

**J. J. W., of N. B.**—Siphons of so great a length as yours are apt to cause trouble by air collecting in the highest part. It is a question whether it will supply the boilers seven in number and 36 feet long. The way to find out is to measure the boiler evaporation for a given time. We cannot tell without more facts.

**M. P., of Mass.**—Many engines are now run by water instead of steam.

**G. S. B., of Mo.**—You have made a confusion in terms. The common collan harp is acted upon by the air, but an eolian attachment to a piano is another thing, and is made to imitate the peculiar tone of the wind instrument.

**F. E. H., of —.**—If you will look in the back numbers of the *SCIENTIFIC AMERICAN*, you will find a good deal upon the time to cut timber. That cut in the months of August, September, and October, is found to be the hardest, heaviest, and most durable, by actual experiment.

**C. J. H., of N. Y.**—We have examined your valve and its arrangement. Will not the steam leak through about the diaphragm as much as it would by unequal expansion of the valves? This trouble is very much overrated.

**N. C., of Wis.**—Any respectable hardware firm will sell you genuine emery.

**A. D., of Ind.**—We have used plain collodion to give an insulating coating to copper wire, with good results. Gun cotton and the dried collodion film are among the best known electrics. There is no such coated wire on sale.

**R. J., of N. J.**—An ordinary jackknife seems generally to be the most handy instrument for removing the tin-foil caps from bottles. This so-called tin foil is lead foil with a very thin skin of tin, and costs only about 30 or 40 cents per lb.

### IMPORTANT DECISION IN INTERFERENCE CASE.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

S. H. Hodges for the Board.

*Interference between the application of Wait and Phelps, and that of A. Witherell.*

No testimony was filed in this case by either party. On reference to the oaths of invention filed with the application, that of Witherell was found to bear date one day previous to that of Wait and Phelps; and, in accordance with the practice of the Office, the question of priority of invention was therefore decided by the Examiner in his favor.

On inspecting the files anew, however, it appears that the authority of the Justices of the Peace, who administered the oaths, is not certified by the County Clerk of their County, in either case, nor by any other officer who is shown to have the custody of their commissions. This was once required by the regulations of the Patent Office, but is no longer insisted on in practice. It is perfectly competent, no doubt, for the Office to dispense with it in *ex parte* hearings, and receive as evidence of the oath, the naked jurat of the magistrate, without inquiring into his authority. If they are satisfied, no one else can well complain, in such cases. But, when the question is between adverse parties, it is to be tried upon the usual rules of evidence, modified by such positive regulations as the Commissioner may prescribe. Among these rules of evidence, it is well settled, that the certificate of a Justice of the Peace, to an oath, is not admissible in trials at law, unless his official character is established under the seal and signature of the officer who has the legal custody of his commission, or is otherwise legally cognizant of his character.

In the course of the proceedings against Aaron Burr, an affidavit of his character, sworn to before such a magistrate, in New Orleans, was excluded upon two grounds, one of which was, that the certificate of the Governor, which stated that a man of the name bore that character, did not also state that he was the person signing the jurat. In *Dunlap vs. Waldo*, 6 N. H. R. 430, a deposition was offered, which had been taken before a Justice of the Peace in New York, and his authority was certified by the Clerk of the County in which it was taken. It was objected to as not sufficiently authenticated, and the necessity of some such voucher was distinctly recognized by the Court in a very full and elaborate discussion. But it appeared further, that in New York the County Clerk has the custody of the proper evidence of the magistrate's official character, and of his having taken the oath; and upon that ground only was the deposition admitted. There can be no question as to the insufficiency of the oaths in the case before us, as evidence between litigating parties. They must therefore be laid aside, and resort must be had to other testimony. No other means of ascertaining the dates of the invention by the respective parties remains except the filing of their applications. That of Witherell's was received in the Office on the 23d of February, 1862; that of Wait and Phelps on the 14th of the same month. The latter must, accordingly, be adjudged the first inventors.

As there are reasons for supposing that this determination may operate upon Witherell as a surprise, he ought to be allowed an opportunity to introduce testimony upon the question, and to have a new hearing for that purpose.

The decision of the Examiner is reversed, and Wait and Phelps are declared to be the first inventors of the device in controversy.

Washington, D. C., Nov. 25, 1862.

### Improved Car Coupling.

There have been many accidents, some of them fatal, in coupling cars in the ordinary manner, and a number of attempts have been made to devise some efficient self-acting coupling, which would obviate the necessity of getting between the cars in the operation, but as none of them have been extensively adopted by railroad companies, it may be inferred that the difficulties in their use outweighed their apparent advantages. The engravings herewith presented illustrate an improved coupling, which, the inventor says, "works beyond my best expectations, being simple and not liable to get out of order. It is said by practical railroad men, who have seen it,

of springs for expanding the rings of cylinder packings. The springs must be set when the cylinder is cold, and while working their tension is affected by the difference in temperature between the ordinary atmosphere and steam. The rattle of loose piston rings while the engine is working, and the loss of steam, and consequently of power, by ill-fitting packing is vexatious. Devices have been contrived to admit steam to the interior of the piston to act as an expander of the rings, but they are usually complicated and liable to derangement. The object of the improvement illustrated by the engraving is to make the use of steam for this purpose economical and effectual.

inner surface of the ring. The ends of the plugs or cylinders, H, act as check valves, alternately on the inner face of the head and the follower, according to the motion of the piston. The arrows show the direction the steam takes in the forward stroke. It will be seen that the steam cannot fill the inside of the head, neither can it find a passage through. It must expend its expansive force directly on the rings themselves. Patent pending through the Scientific American Patent Agency. For further information address Bernard Jacobs, Selma, Ala.

### Are You Insured?

The total amount of property destroyed by fire in

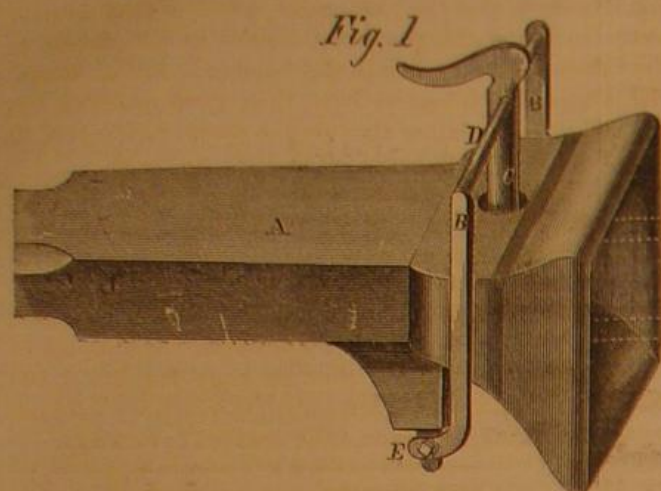


Fig. 1

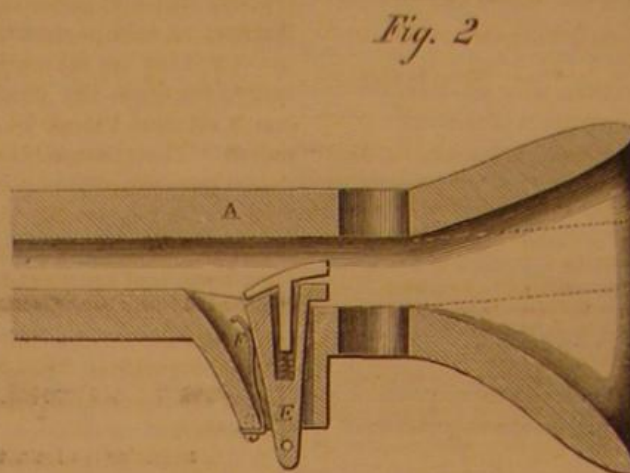


Fig. 2

### PARSONS'S CAR COUPLING.

to be the best self-acting coupling they have seen, as the common pin and link can be used with it."

Fig. 1 is a perspective view of the coupling complete, and Fig. 2 is a sectional view of the same, showing the catch pin. A is the draw bar or shell, of cast iron as usual. The bars, B, Fig. 1, are of round or half-round iron, and slide up and down in slots cut in the sides of the shell. They are connected at the top to the pin, C, by the bar, D, and are curved under at the bottom and meet at the catch pin, E. It will be seen that when the pin, C, is raised, the catch pin, E, is also raised, and the head catches on the edge of the V-shaped space, and is held in position by the spring, F, thus sustaining the pin in its elevated position.

The operation is simple.

The link passes in, and striking against the catch pin, drives it back, thus letting the link pin drop, while the catch pin, at the same time, falls out of the way. The subsidiary pin, G, drops into a hole in the catch pin, at the bottom of which hole is a coiled spring. This is intended to present a higher surface to the action of the link, so that when it is presented at an upward angle it cannot pass over the head of the catch pin without striking. The subsidiary pin is kept from lifting out by means of a key.

A shoulder is cast upon the inside of the shell back of the link-pin, which prevents the link from passing into the back of the space in which the catch pin plays. This secures the catch pin from injury. The back of the head of this pin is beveled so that the link, in uncoupling, cannot catch it, but will slide over the top. The seat of the link is on an incline and the mouth of the shell unusually flaring, especially on the lower lip, to insure the entrance of the link at all angles.

This improvement was patented Feb. 13, 1866, by J. H. Parsons, Quincy, Mich., whom address for further information.

### Improved Piston Packing.

There is always more or less annoyance in the use

A represents the "spider" or piston, in which the rod, B, is secured in the usual manner. C is the follower, fastened in the ordinary way, by bolts, the heads of which are shown at D. A circle or annular ledge, shown at E, supports the inner ring, F. This ring is in two semicircles, one end of each furnished with inward-projecting lips which project toward the center in radial spaces which divide the rim, E, into two parts. These lips are to retain the inner ring in place. This ring is beveled or inclined on its outer surface from the center to the edges, and on its outside circumference are fitted the outer rings, G, which are sawed obliquely across in segments in the usual manner. Their edges are ground to the inner surfaces of the head and follower steam tight. It will be seen that any pressure from the inner ring

this country, during the past six months, is estimated at \$44,000,000. The insurance companies have suffered heavy losses, but with few exceptions they have faithfully responded to every call. We advise all property owners to get their buildings insured. They have no other reliance against losses by fire.

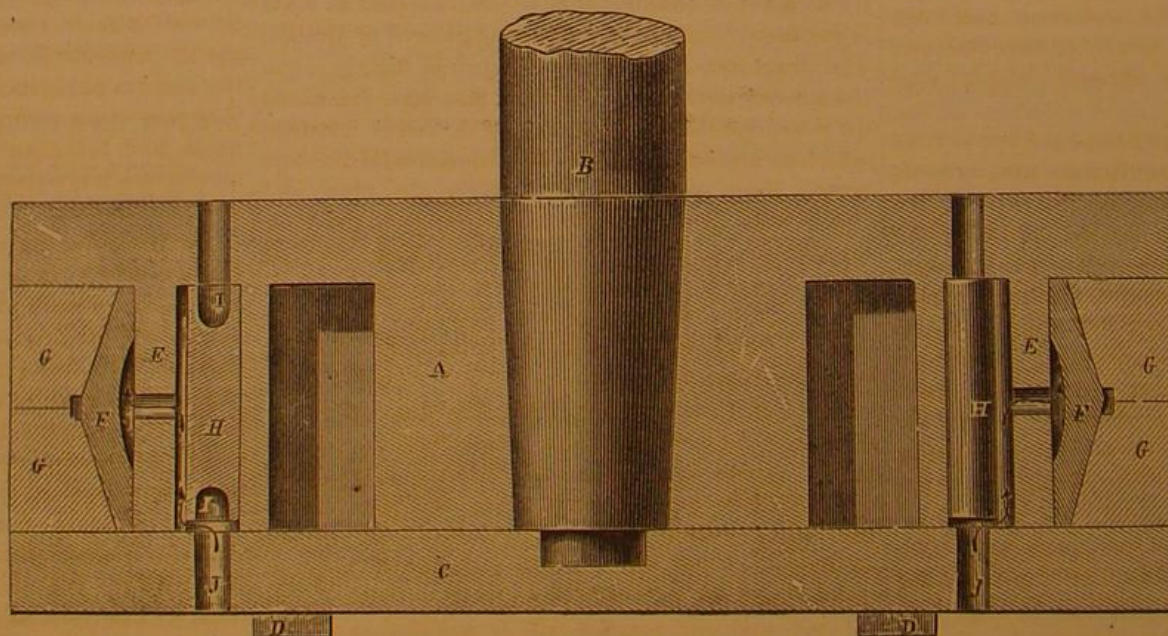
### Red of Sorghum.

It is a fact long known, that sorghum contains a red coloring-matter. The following is the process used by Mr. Winter to extract it:—

The canes of the sorghum are stripped of their leaves and reduced to a pulp in a rolling mill, and well pressed, to extract the juice from them. The juice is used to make sugar or alcohol. The ligneous tissue soon begins to ferment rapidly. Care

must be observed to prevent too rapid fermentation, because by an elevation of temperature, the mass will become putrid. When the operation has well proceeded, and the mass, after fifteen days, has acquired a red or brown color, stop the fermentation by drying, and grind the matter to divide it.

To isolate the coloring matter, infuse the powder for twelve hours in cold water, which dissolves a little coloring property. Press the mass strongly and put it to macerate with a very weak caustic lye, filter, press, and saturate the liquors with sulphuric acid. The coloring matter is separated in red



### JACOBS'S PISTON PACKING.

outwardly would have a tendency not only to force the outer rings against the inside of the cylinder, but also to press them firmly against the head and follower. This outward pressure is effected by steam. In lugs cast in the spider, just inside the circular ledge on which the inner ring fits, are holes reaching from the inside of the follower to the inside of the head, in which are loosely-fitting cylinder plugs, H, with a drilled recess at each end, as at I. A semicircular or concave recess, forming a part of this hole, connects by small apertures in the head and follower with one through the annular ledge, E. Now, if steam is admitted at J, it finds its way to the outside of the ledge, E, and fills the annular recess, F, on the

flakes, which are collected on a filter, washed, and dried. This color is nearly pure, very soluble in alcohol, alkalies, weak acids, etc.

To dye silk and wool with it, use the ordinary tin mordant. Mr. Winter has noticed that the dyes made with this red resist the action of the light, and a moderate bath of hot soap. The extraction and uses of this coloring matter are known and practiced in China, where sorghum is cultivated on a large scale.—*Bulletin de la Soc. d'encour.*

IN 1740 only 17,360 tons of iron were made in England, and no less than 2,275 tons were imported during the same year, from America.

# 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., Bookellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions and advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attended to.

"The American News Company," Agents, 121 Nassau street, New York.

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.

VOL. XV., No. 5, [NEW SERIES.] Twenty-first Year.

NEW YORK, SATURDAY, JULY 28, 1866.

## Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Brick Machine.....	68
On Flying Machines.....	68
Miscellaneous Summary.....	68
The Children of Mechanics.....	68
The Steam Engine Indicator.....	68
*Rifle Shooting.....	68
An Immense Temple of the Muses.....	68
Removing Hypsulphites.....	68
*Spaulding's Patent Broom-head.....	68
The Queen's Portrait for Mr. Peabody.....	68
Strange Inconsistency.....	68
Silicated Whitewash.....	68
Useful Recipes.....	68
Clay vs. Iron Gas Retorts.....	68
Pressure in Boilers.....	68
Home-Made Aluminum.....	68
Questions for Millers.....	68
The European Squadron.....	68
The Heated Term—How to Keep Cool.....	68
*Photographs.....	69
New Inventions.....	69
The Markets.....	69
Notes and Queries.....	69
Important Decision in Interference Case.....	69
*Improved Car Coupling.....	70
*Improved Piston Packing.....	70
Are You Insured?.....	70
Red of Sorghum.....	70
Importance of Rags.....	71
The Production of Timber.....	71
The Needle Gun.....	71
Our Commercial Marine.....	71
Water Supply of Philadelphia.....	71
Patent Claims.....	72, 73, 74, 75
Advertisements.....	75, 76, 77
*Improved Oilier for Machinery.....	78
*Improved Gas-Pipe Tongs.....	78
Resin in Collodion.....	78
Patents in Canada.....	78

## IMPORTANCE OF RAGS.

The wealth that is brought into existence by manufactures, or reproduced from apparently valueless substances by the marvelous, transforming power of human ingenuity, impelled by human wants, is a subject of surprise, even to the thoughtful observer. Enormous quantities of refuse matter are transformed into healthful fruits, grains, vegetables, and flowers, by the liberation of their gases and the dissolution of their salts. Bones, discarded by the housewife as useless, are wrought into forms of use and beauty, but in no instance is the value of articles which have outlived one condition of usefulness, and been submitted to the re-creative power of manufacture, more apparent than in the change which rags undergo.

From time immemorial rags have been the symbol of poverty, worthlessness, and vileness, and, as such, are referred to in the Bible and in the earliest profane works. Their usefulness as a material for paper seems, however, to have been discovered several centuries ago. The oldest specimen of paper made from linen rags contains a treaty of peace between the kings of Aragon and Spain, bearing the date of 1178. Raw cotton was, however, used for paper making before this time. It is tolerably certain that mills for making paper from rags were operated in Spain as early as 1085 (*vide* "Chronology of Paper and Paper Making," by J. Munsell.)

Rags, particularly cotton and linen rags, have been for many years one of the housewife's perquisites, and many a shining treasure in the kitchen and many an elegant teapot on the table, has borne witness to the thrift of the good woman in her practice of economical saving. All these rag-savings find their way to the paper mill. Their price has more than quadrupled since the diminution in the supply of cotton caused by the war. But the supply of this country is wholly inadequate to the demands of the manufacturers and the public. Once writing paper was not very generally used—at least, the people generally required but a small portion compared to the quantity they now demand. It might have been supposed that the increasing facilities of travel would have diminished the necessities for writing; but the contrary seems to be the case. Personal contact and mutual acquaintance beget new commercial alliances, and correspondence is necessary. The rags made in this country constitute but a small portion of those used by American manufacturers. We imported for the quarter of the present year ending June 30th,

rags to the value of \$426,766. In the ten years ending with 1865, the amount of rags imported was 209,883,718 pounds. Italy furnishes a large proportion of the rags brought into the United States. Everybody has heard of the Italian lazzaroni, who wear the scantiest dress of the filthiest rags; yet from this unpromising source nearly three-fourths of our supply comes.

Italy is the country of the open palm, and begging and rags go together. Begging there, and in other parts of southern Europe, is as much a profession as any industrial pursuit in this country, and the uniform of rags is more important to its successful prosecution than is the Government livery to the soldier. Still, valuable as rags are to the professional beggar, and important as they may be to abject poverty, they are far more important to the world at large; for up to the present time no other material has been found to usurp their place as the basis for paper. Their scarcity and constantly enhancing value have stimulated ingenuity to provide a substitute, but it has not been so successful as could have been wished. Straw, wood, and other substances have been, and are now, extensively used in the manufacture of the coarser papers, but nothing equals linen and cotton for the production of the finer and finer qualities. Some of the European Governments, for this reason, have prohibited their exportation.

It is a little singular that advances in knowledge and refinement—the triumphs of intellect and the spread of intelligence—are so closely dependent upon the contributions of ignorance and poverty. Possibly the sheet upon which we are now writing, and the page that will bear to our thousands of readers these printed lines, were once the filthy rags that but half concealed the nakedness of a Neapolitan beggar or an Egyptian fella. It is to be hoped that the transformation they have undergone is typical of the improvement which education and the arts are yet to work upon the meanest of the race.

## THE PRODUCTION OF TIMBER.

Bayard Taylor, in a recent letter from Kansas, says that hundreds of acres of prairie, which have been protected from fires by contiguous cultivated fields, are overgrown with hickory and oak trees from four to six feet high. Where land is tolerably well watered and undisturbed, especially if in vicinity of wooded country, it will give support to what is commonly called a spontaneous growth of timber. The character of the growth depends mainly upon the quality of the soil. The seed may have remained for years in the soil, possessing a latent vitality, which awaits only favorable conditions for its development. Poor soils seem first to favor the pine, and this in turn gives place to the more rapid-growing deciduous trees, until the chestnut and the oak find fitting support and conditions for their growth and development. But in a country like this, where the demand for timber for manufacturing and building purposes threatens to rob us of our forests, it may not be well to rely wholly upon the unaided forces of nature for a supply. The resolution introduced into Congress to offer incentives to the planting of our immense prairies with trees, we regard as a timely suggestion. The great drawback to the settlement of those vast fertile plains is the absence of wood and an unfailing supply of water. These secured, and our prairies will be selected in preference to localities less favorable to agricultural pursuits, but which furnish wood and water in profusion.

Wherever there are forests there will be water, and the last is an indispensable requisite to human habitation. A section of country unprovided with elevated points as gatherers of the moisture of the clouds, must have a clothing of forest to retain the rains, which, on a naked plain, alternate periods of extreme drought with seasons of superabundant moisture.

## THE NEEDLE GUN.

So much has been said about the Prussian needle gun of late, in the foreign journals, and the success of the Prussians with it, that many suppose it to be a new invention. On the contrary, it is twenty years old. We do not desire to depreciate it on this ground, but judging it solely by its intrinsic merit, it

is not up to the standard of American breech loaders. All military men know that an essential point in a firearm is simplicity and certainty in fire. Neither of these qualities is found in the needle gun, for the mechanism is clumsy compared with recent inventions, and the ammunition is complicated, and costly to prepare. The principal idea in this weapon is in firing the charge from the front instead of behind, as in other weapons. To do this the percussion powder is put into a cavity in the base of a paper sabot, between the ball and the powder, the charge being exploded by a wire or needle thrust through the cartridge.

The experience gained in the war of the rebellion shows us that the "magazine arm," or that weapon where the charges are contained in the breech, is most deadly, when in the hands of skillful troops. Other breech loaders have their good qualities, but all who remember the part the Spencer rifle bore in the contest will concede the point we make.

Breech loaders have this disadvantage: troops must be trained long and thoroughly, or in the heat of battle the charges will be thrown away from heedless firing. The Prussian army have had experience with breech-loading guns for fifteen years, and in their recent battles did well. We published an engraving of this gun on page 124, Vol. 5, Old Series, SCIENTIFIC AMERICAN, to which we refer our readers. This was in 1850, nearly 17 years ago.

## OUR COMMERCIAL MARINE.

The depredations inflicted on our commerce during the war were so serious as to create a fear that many years of peace would be required for its recovery. Indeed, when the devastations of war in our own borders were taken into account, the prospect was very disheartening. In 1856 seventy per cent of our foreign commerce was carried in American bottoms, while, in 1865, only about twenty per cent was under our flag. To be sure this enormous falling off was not occasioned by the destruction of American vessels, but was caused by the sale and transfer of our ships to foreign merchants, in order to obtain the protection of European flags which our own could not accord.

It is evident, however, that already we are rapidly assuming the position we occupied as a commercial nation before the war. Several causes combine to assist this recuperation. The abundance of material for ship building, our extended coast line, the fisheries with their thousands of hardy mariners, and the immense traffic of our seaports, sending away the surplus products of our vast interior, with which they are connected by navigable rivers and iron roads, and bringing in the manufactures of Europe, all direct a large portion of our enterprising energy into the channels of commerce.

The breaking out of a war in central and southern Europe, which threatens to involve every continental nation, and possibly England, will create additional demands upon our commerce. We must assist in feeding their immense armies and in supplying the places of the hundreds of thousands who are drawn from the pursuits of peace. Our shipyards, our wharves, our seaports, and the country at large, will feel the stimulus this state of affairs engenders. Too far removed from the scene of strife to be involved in its complications, our commercial connection with the nations of Europe will affect our industrial interests, in one respect at least, favorably.

## Water Supply for Philadelphia.

The water works of Philadelphia have been for years a great curiosity to strangers. Fairmount has been one of the "lions" of Philadelphia. The reservoir, with its accompanying machinery for elevating and distributing the water of the Schuylkill, has been considered a monument of engineering skill and successful endeavor. It is found out, however, that the growing requirements of the city demand a new or at least an additional supply of water. Mr. Birkenbine, the Chief Engineer, proposes to obtain a supply of water from Perkiomen Creek, and form a lake or reservoir of supply, in Montgomery county, nearly 27 miles from the city, and to conduct the water through an aqueduct to some high point within or near the limits of the city, on which a distributing reservoir shall be constructed. This, it is thought, will give a head of 75 feet above

that of Fairmount, and the estimated expense is about \$10,000,000.



ISSUED FROM THE U. S. PATENT OFFICE  
FOR THE WEEK ENDING JULY 17, 1866.

Reported Officially for the Scientific American.

**33** 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.

**56,343.—EVAPORATING AND DISTILLING LIQUIDS.—**James Adair and H. W. C. Tweddle, Pittsburgh, Pa.

We claim the mode of distilling or evaporating petroleum or other fluids by passing through or over the liquid to be distilled or evaporated, heated carbonic oxide or carbonic acid, substantially as and for the purposes described.

Second, The combination of the air-tight furnace through the fire in which air and steam or either of them are forced, with the still or boiler for holding the liquid to be distilled or evaporated, and the pipes connecting the furnace and still or boiler, constructed and operating substantially as and for the purposes hereinbefore described.

Third, The air-tight furnace, A, constructed substantially as described for the production of carbonic oxide or carbonic acid, to be used in the manner of artificial combinations or mixtures of carbon with other fluid or solid bodies.

**56,344.—CULTIVATOR.—**Isaac Avery of Ottawa, Ill.  
I claim, First, The attaching of the plow beams, A\*, to pendants, a\*, of the cross bar, C, by means of universal joints, D D', substantially as and for the purpose specified.

Second, The combination of the plow beams, A\*, universal joints, D D', doubletree or eveners, C, trace chains, E, and pulleys, e\*, all arranged to operate in the manner substantially as and for the purpose herein set forth.

**56,345.—EXTENSION IN CORSET SPRING.—**S. H. Barnes, New York City.

I claim a corset spring, consisting of the parts, B, provided with pins, b, and slotted springs, B2, riveted as shown and having suitable clasps, C, and headed rivets, D, and of form corresponding to the body of the wearer, all constructed and operating in the manner and for the purpose herein represented and described.

**56,346.—ANVIL AND VISE COMBINED.—**J. D. Barton, F. S. Rogers and D. Fisher, Kalamazoo, Mich.

We claim the upright shaft, B, and levers, C and E, in combination with the several anvil appliances constructed and arranged substantially as described.

**56,347.—SASH FASTENING.—**Burroughs Beach, West Meriden, Conn.

I claim a sash supporter, consisting of the arms, A, in combination with the lever plate, K, and springs, E, when arranged together so that the said plate will act upon the said arms, substantially as described and for the purpose specified.

**56,348.—GRAIN DRIER.—**H. H. Beach, Rome, N. Y.  
I claim, First, The within described grain drier, composed of the inclined perforated plates, B B', etc., and flues, G and H, the whole being arranged substantially as and for the purpose herein set forth.

Second, In combination with the above, I claim the vanes, x x', etc., arranged substantially as specified.

**56,349.—BOTTLE STOPPER.—**Josiah Beard and Moses Fairbanks, Boston, Mass.

We claim a protecting cap in combination with the stopper and fastening wire, passing through both the said cap and stopper as described.

**56,350.—PLOW.—**Charles Beidler, Allentown P. O., Pa.

I claim the segmental guide bracket, b, in combination with the screw rod, g, set nuts, j, handles, C C, and beam, A, and operating in the manner and for the purpose substantially as herein shown and described.

**56,351.—MARINE CAR.—**A. Blomquist, New York City, and C. Crook, Yonkers, N. Y.

We claim the arrangement of the drums, B B C, and paddle, D, in combination with the platform, A, constructed and operating in the manner and for the purpose herein specified.

**56,352.—WATER DRAWER.—**S. R. Boardman, New York City.

I claim, First, A well bucket, having three or more valves in the bottom thereof, and arranged at equal distances from each other, each valve being provided with a stem so arranged and operated that the ascent of the bucket will open those and those only that are upon that side of the bucket presented to the curb spout, as and for the purpose specified.

Second, In combination with a series of valves arranged around the bottom of the bucket as described, I claim a corresponding number of spouts attached to the bottom of the bucket, as and for the purpose set forth.

**56,353.—PLASTER.—**M. C. Bogiea, and H. B. Taylor, Philadelphia, Pa.

We claim a plaster consisting of mustard or other material or composition, permanently confined between layers of textile or other fabric, substantially as and for the purpose described.

**56,354.—MECHANICAL MOVEMENT.—**William Brant, Paris, Ill.

I claim the mode of imparting a reciprocating and alternate rotary movement to the shaft, G, by means of pulley, D, and thong, E, or devices substantially equivalent, all arranged to operate in the manner and for the purpose set forth.

**56,355.—WELL PIPE OR TUBES.—**S. Brewer and W. W. Winter, Cortlandville, N. Y.

We claim the device consisting of the springs, B B B, the shield, A, and the rod, D, all in combination, as and for the purposes herein shown and described.

**56,356.—APPARATUS FOR PREPARING STARCH, SIZE, ETC.—**John Briggs, Roxbury, Mass.

I claim in combination with stirrers, the tank, d, and foraminous cylinder, e, all operating together for the purpose set forth. Also the steam jacketed pipe, s, when provided with the screw, o and arranged to operate substantially as described.

**56,357.—BEER FAUCET.—**Charles Brown and C. McGhie, Chicago, Ill.

We claim the plunger, B, provided with the hollow stem, C,

having the holes, e' e' and c, therein as shown, in combination with the stem, D, having the spiral grooves, d, cut therein, when said parts are arranged to operate in connection with the body of the faucet, as and for the purpose set forth.

**56,358.—TOY SLED.—**John H. Brown, New York City.

I claim the combination of the button, G, rods, e f, and rudder, E, arranged with the horse, D, and sled, A, and operating in the manner and for the purpose herein specified.

**56,359.—HORSE HAY FORK.—**J. S. Brown, Washington, D. C.

I claim the employment of movable bars, D D, to cover and uncover fixed bars or shoulders, C C, substantially as and for the purposes herein specified.

I also claim a divided shaft, A, to be opened in dovetail or inverted wedge form, and closed in connection with the uncovering and covering of the bars, by movable bars, D D, substantially as and for the purposes herein set forth.

**56,360.—CLOTHES DRIER.—**O. C. Brown, Iberia, Ohio.

First, I claim broadly a clothes drying rack consisting of a series of suspending rods, bars or equivalents, attached to flexible supports to adapt the rack, as a whole, to be wound upon an axis or windlass, in any manner substantially as described.

Second, I claim a flexible clothes rack consisting of the straps, C C', blocks, D D', and supporting bars, F, all combined and operating substantially as described.

Third, In combination with the above I claim the frames, A A', and windlass, a2, arranged and operating substantially as described.

**56,361.—LAMP BRACKET.—**T. W. Brown, New York City.

I claim the improved socket plate made with the recess and its openings and the semicircular bearing arranged with the projection of such plate, substantially as specified.

I also claim the application of the reflector supporter, d, to the socket plate, B, instead of applying it to the ring arm in the usual manner, the same presenting advantages in the casting of the ring and its arm.

**56,362.—HORSE POWER.—**H. L. & J. A. Buckwalter, Kimberton, Pa.

First, We claim, in the construction of horse power, the combination in one wheel of the sprockets which engage the shafts of the chain and the cogs which communicate motion to the counter shaft, substantially as described.

Second, We also claim in horse power placing two counter shafts in gear with the cog wheels of the machine, one within and one without their rims, in combination with the belt wheel, the same being so made and arranged that the belt wheel may be changed from the one to the other at the pleasure of the operator, substantially as described.

**56,363.—ROOFING CEMENT.—**M. Buell, Truxton, N. Y.

I claim, as a new article of manufacture and sale, the paint or composition which I have herein described.

**56,364.—COFFIN.—**John Burns (assignor to himself and Joseph W. Baker), Providence, R. I.

I claim, combining with a wooden coffin of the usual construction, a lid of marble or other equivalent material, substantially as described for the purpose specified.

**56,365.—CRIMPING MACHINE.—**G. Cabell, Quincy, Ill.

First, I claim the combination and arrangement of an iron, F, in one or each of the hollow fluted cylinders, A, substantially in the manner and for the purpose as herein set forth.

Second, The sliding pivoted cap plates, G, as arranged in combination with the fluted cylinders and irons, substantially in the manner and for the purpose as herein set forth.

Third, The slotted curved spring, B, screw rod, C, projecting arm, D, and grooved collar as arranged in their connection with the upper fluted cylinder and vertical tapered bars, b, and operating substantially in the manner and for the purpose as herein set forth.

**56,366.—POTATO DIGGER.—**F. Caldwell, Oxford, Me.

First, I claim the combination and arrangement of the geared wheels, d and c, shaft, e, eccentric, f, and connecting rod, n, as and for the purposes herein described, the said wheel, c, shaft, e, eccentric, f, and the sifter, s, being attached, as set forth, to the tilting frame, F, and the shaft, e, being also employed to give motion to the endless apron, k.

Second, The combination and arrangement of the arms, g h, and helical spring, i, to hold the sifter, as described.

Third, The arrangement of the tilting frame, F, upon the shaft, E, for the purpose herein set forth and described.

**56,367.—TEAPOT.—**Robert Carter, San Francisco, Cal.

First, I claim the bottom, n n, figure 2, of the inner case, H, figure 2, being formed convex toward E, figures 1 and 2, the bottom of the outer case, D, figures 1 and 2, for preventing the violent ebullition of the water contained in K K K, figure 2, when boiling, as would ensue if the bottom of H, figure 2, was flat.

Second, And without confining myself to any particular shape, size, or material, I claim as mine the general combination of the two cases, with their surroundings and appurtenances, as in this specification shown, for the purposes described and in the manner substantially herein set forth.

**56,368.—IMPLEMENT FOR OPENING SHEET METAL CANS.—**Seth P. Chapin, Atlantic, N. J.

I claim the cutter, B, curved in its cross section and provided with sloping cutting edges a' or a2 as described, when secured upon a handle or stock provided with a shoulder, d, to operate substantially as herein set forth for the purpose specified.

**56,369.—SKATE.—**E. G. Chormann, Philadelphia, Pa.

First, I claim the combination of the plate, A, and its runner, C, the plate, A', and its runner, C', and the screw, B, and sliding block, c, or equivalent device whereby the runners may be adjusted at any required distance from each other, the whole being constructed and arranged substantially as described.

Second, The combination, substantially as illustrated in figure 4, of the adjustable plates, A A', with the rollers for the purpose described.

**56,370.—MACHINE FOR SHELLING PEAS.—**George Clark, Jr., Boston, Mass.

I claim the combination of rotating rollers, face plate and screw clamp, whether with or without the scraper, for the purpose of expressing peas and other seeds from their containing vessels when the same are constructed and used substantially as described.

**56,371.—CAR COUPLING.—**D. Clinton, Peoria, Ill.

I claim the combination of the oblique faced hook, B, spring, c, and eye, E, the latter serving as a stop for the end of the spring, and constructed and arranged to operate together in the manner and for the purposes herein specified.

**56,372.—CORDAGE MACHINE.—**Charles Cobb, Plymouth, Mass.

I claim the combination and arrangement of the self-adjusting guide with the layer arm and the notch thereof, such guide being to operate with the laying drum substantially as set forth.

**56,373.—SPRING BED BOTTOM.—**Alexander Cole, Lockport, N. Y.

I claim the combination of the slats, C C, hangers, E, guide rods, c c, coiled springs, s s, and stops or cross pieces, H H', the whole arranged and operating substantially in the manner and for the purpose set forth.

**56,374.—CHURN Dasher.—**E. G. Connelly, Jasper, Ind.

I claim the construction of the dasher, C and C', with the valves, g and g', with either a double or single dasher, operating in the

manner and for the purpose substantially as set forth in the above specifications.

**56,375.—HORSE HAY FORK.—**A. J. Cooley, Char-don, Ohio.

First, I claim the arrangement of the arms, C, shanks, A A', and links, a, with the catch, F, spring, d, and notch, e, as and for the purpose substantially as set forth.

Second, The hooks, B B', with the connecting ropes or chains in combination with the loops, G G', shanks, A A', and bands, D, substantially as and for the purpose set forth.

**56,376.—INVALID BEDSTEAD.—**Henry Cordes, Bell-ville, N. J.

I claim an invalid bed formed by combining the pipes, B and G, the plates, E C D and I, the sheet, F, valve, G, and spring, L, with each other, and with the bed or mattress, substantially as described and for the purpose set forth.

**56,377.—TOOL HOLDER.—**Francis T. Cordis, Long-meadow, Mass.

I claim as a new article of manufacture, the holder, constructed substantially in the manner herein set forth.

**56,378.—APPARATUS FOR TREATING ORES.—**J. C. Coult and J. Roach, San Francisco, Cal.

First, We claim the pipe, C, connecting with a furnace, and having a wide opening entering the condenser, E, thereby imparting a greater distribution of the fumes as they enter said condenser, or water tank, and equally spreading the fumes over the water, substantially as described and for the purposes set forth.

Second, We claim the tank, E, with an inclined bottom, and the partitions, b b b, in the inverted tank or cover of the same, and the adjusting screws, F F, attached thereto, substantially as described and for the purpose set forth.

Third, We claim the perforated diaphragm, G, having sufficient openings to equal the opening of pipe, C, where it enters the condenser, E, as before stated; likewise the water bottom, G' and G', over which the fumes collect and are drawn into a fan or pump; also giving a water bottom, H, to the fan or pump, thereby bringing the fumes again in contact with the water for a long distance, and extracting all that it may be desirable to collect before allowing an escape into the chimney, substantially as described and for the purposes set forth.

**56,379.—STOVEPIPE DAMPER.—**B. F. Cowan, New York City.

First, I claim the rotating spheroidal valve damper above shown, constructed and operating substantially as described.

Second, I also claim the rotating damper above shown in combination with openings in both sides of that part of the pipe within which the damper revolves, substantially as described.

**56,380.—PUMP FOR DEEP WELLS.—**Benjamin Crawford, Allegheny, Pa.

First, I claim the detached rod, t, in combination with the lower valve, q, for the purpose of keeping the lower valve closed on the down stroke of the piston.

Second, The combination and arrangement of the lever, y, and valve rod, t, with the cam, a', and pendant, d', for raising and lowering the valve rod, t, to relieve the lower valve, q, of its pressure when the up-stroke begins, and hold it down on the commencement of the down stroke, substantially as described.

Third, The combination of the check valve, h, and gas pipe, j, e, with the working valve of a pump, constructed and arranged substantially as and for the purposes hereinbefore described.

Fourth, In its arrangement with the devices described in the third claim, the trap, c, in the flow pipe to prevent the passage of gas in that direction, substantially as described.

**56,381.—WOVEN FABRIC.—**George Crompton, Worcester, Mass.

I claim a textile fabric, woven with braided threads, substantially as described.

**56,382.—EGG BEATER.—**Joshua Davis, Schenectady, N. Y.

First, I claim an eccentric beater in combination with a revolving pan or vessel, substantially as and for the purpose set forth.

Second, The three bevel wheels, B C E, of differing diameters, one of which is adapted for carrying a pan or vessel, in combination with a revolving eccentrically-arranged stirrer or beater, substantially as described.

**56,383.—SYSTEM OF CUTTING DRESSES.—**Catharine Dittenhafer, Canton, Ohio.

I claim the within described patterns and system of cutting ladies' and children's dresses, sacques, and basques, when used in the manner substantially as herein specified.

**56,384.—SLIDE VALVE.—**John B. Dougherty, Rochester, N. Y.

First, I claim the arrangement of the exhaust port, e, inlet ports, a a and m, in combination with the rollers, r r, and the steam pipe, p, which combination and arrangement avoids the necessity of a relieving or balance plate.

Second, The combination of the rollers, r r, in slide valves, with the bars, i, when the same are used without a steam chest, as and for the purposes shown and described.

**56,385.—SLIDE VALVE.—**John B. Dougherty, Rochester, N. Y.

I claim the arrangement of the ports, c and e, in combination with one or more ports through the relieving plate, P, and the exhaust port, a, substantially as and for the purposes set forth, when the valve is used without a steam chest.

**56,386.—ELEVATOR BUCKET.—**Henry Dover and James Storms, Buffalo, N. Y.

We claim an elevator bucket constructed as herein described.

**56,387.—PUMP.—**Samuel S. Durbon, Lebanon, Ind.

I claim the tubular valve seats, 66, the spindle gum valves, 77, the self-adjusting leverage, 13, with valves, 15 15, the self-adjusting gum piston, composed of 12 and 3, and the elliptic, L, with the eccentric, L', all arranged and operating substantially as and for the purpose set forth.

**56,388.—FLASK FOR CASTING STEEL INGOTS.—**Zo-heth Sherman Durfee, Pittsburgh, Pa.

I claim as my invention the mode of casting ingots of steel or other metals, by pouring or tapping such metal upon a piston, in a mold so arranged and constructed that, as the metal is continuously introduced, the piston may be caused or permitted as continuously to descend and be followed by the metal, while at the same time, the metal already poured, or the greater part thereof, remains at the same, or nearly the same height in the mold, that portion successively being introduced flowing through that already poured, and folding outward against the surface of the mold, at or near the surface of the piston as the piston gradually descends in the mold.

**56,389.—HARVESTING MACHINE.—**Rufus Dutton, New York City.

I claim the construction and arrangement of the track-board cap, D, in combination with the grass shoe and its projecting spur, a, and the track board and its spur, c, the whole arranged and operating substantially as and for the purposes set forth.

**56,390.—FRUIT CAN.—**B. F. Ells, Dayton, Ohio.

I claim the flanged top, A, provided with sealing wax, as set forth, and used with the can, B, in the manner and for the purpose described, whereby a can is formed which, when filled with fruit, will seal itself, substantially as specified.

**56,391.—BOOTS AND SHOES.—**Martin E. Ethridge, Lock Mills, Me.

I claim the combination, as well as the arrangement, of the two welts, a b, with the insole, B, the upper, and the outer sole, D.

I also claim the combination and arrangement of the metallic cap sole, E, with the wooden outer sole, D, the two welts, a b, the insole, B, and the upper, A, arranged and applied together, substantially as set forth.

I also claim the arrangement and combination of the cushion, C, with the insole, B, outer sole, D, and the upper, A, disposed together, substantially as set forth.

I also claim the combination of the perforated cap sole, E, and the gutta-percha sole, E', or its equivalent, applied to the wooden outer sole, D, as set forth.

I also claim the combination and arrangement of the layer, d of shellac, or its equivalent, with the wooden sole, the two welts, the insole, and upper, arranged and applied together substantially as explained.

**56,392.—GATE.**—Simeon F. Emerson, Seville, Ohio.  
First, I claim the horizontal arm, E, of the pivoted hinge, C, operating with the top board, D, of the gate, substantially as described and for the purposes set forth.  
Second, The combination of the roller, H, and the arms, G, having projecting ends or lugs, with the top rail, I, of the fence, and with the top board, D, of the gate, substantially as described, and for the purpose set forth.  
Third, The combination of the guide bar, K, and arms, J, with the post, A, and with the gate, substantially as described and for the purpose set forth.

**56,393.—MACHINE FOR MAKING CORDED BINDING FOR INDIA-RUBBER AND OTHER FABRICS.**—Chas. A. Ensign, Naugatuck, Ct.  
What I claim is an organized, automatically-operating machine, substantially such as described, for making binding for india-rubber, or other fabrics.

**56,394.—LOCK.**—Philo S. Felter, Cincinnati, N. Y.  
I claim, First, The combination of the wheels, E and F, tumbler, D, and key-hole guard or cover, C, arranged and operating together, substantially as described and specified.  
Second, The combination of the wheels, E and F, tumbler, D, key-hole cover, C, with the arbor, H, and dial, G, arranged and operating substantially as described and specified.  
Third, and in combination with the subject-matter of the above, I claim the detachable plate, K, arranged as described, for operating the lock without recourse to the numbers of the set by which it is locked, substantially as described and specified.

**56,395.—OPERATING ORDNANCE.**—John H. Field, Saugerties, N. Y.  
I claim the combination of the circular rack, D, and endless screw, G, mounted on an eccentric shaft, g, and operated by levers and the double-acting pawls, h h, substantially as and for the purpose herein specified.

**56,396.—STEAM GENERATOR.**—Matthew Fletcher, Louisville, Ky.  
First, I claim the arrangement of the vertical steam boiler, with the round pan, I, and water leg, a, as herein described, and for the purposes set forth.  
Second, I also claim the cone, M, in the chimney, d, substantially as described, and for the purpose set forth.

**56,397.—HARVESTER.**—Elias T. Ford, Stillwater, N. Y.

First, I claim the frame, C, hinged to the front extremities of arms, D D, in combination with the rod, E, adjusting bar, F, and pole-section, Q, embracing the tube, B, substantially as described.  
Second, I claim the left arm, D, forming the pillow block or frame, constructed as described, and provided with the bearings, e f, hanger, R, and universal box, S, and arranged in relation to the tube, B, and frame, C, substantially as described.  
Third, I claim the lever, K, constructed as described, and pivoted at v v, to standards on the shoe, L, in combination with the flange tops, v3 v3, formed on said standard, in the manner and for the purpose specified.  
Fourth, I claim the arrangement of the adjustable rod, F, hanger, R, box, S, bar, E, lugs, V V, shoe, L2, and lever, a, in combination with the tube, B, arms, D D, and frame, C, in the manner and for the purpose herein specified.

**56,398.—RUBBER ROLLERS FOR WRINGING MACHINE.**—James B. Forsyth, Roxbury, Mass.

I claim curing rollers of india-rubber, or other vulcanized gum, on a hollow core, substantially as and for the purpose described.

**56,399.—BREECH-LOADING FIRE ARM.**—Geo. P. and Geo. F. Foster, Mohawk, N. Y.

We claim the pintle, K, constructed and operated substantially as described, that is to say, being forced to the rear by the back pressure of the cartridge in loading, driven forward by the impingement of its rear end upon a projection on the abutment, or its equivalent, and sustained by the spring, L, in the annular groove, in position to hold the cartridge case free for subsequent retraction or ejection.

**56,400.—SPITTOON FOR RAILROAD CARS.**—F. H. Furniss, Crestline, Ohio.

First, I claim constructing a spittoon with a valve seat, C, and valve, C', as set forth.  
Second, I claim the stem, B', and spring, D, in combination with the valve, C', and body, B, as and for the purpose herein set forth and described.

**56,401.—HORSESHOE.**—E. C. Gero, Galesburg, Mich.  
I claim the shoe, d d, with spring, a, springs, b b, and pads, c c, constructed and used substantially as and for the purposes herein set forth.

**56,402.—BAG HOLDER.**—Cyrus F. Gillett, Sparta, Wis.

I claim the ring, C, applied within the funnel, A, for the purpose of holding the upper end of a bag, substantially in the manner described and shown.

**56,403.—MACHINE FOR GRINDING CUTLERY, ETC.**—Russell S. Gladwin, Meriden, Ct.

I claim, in combination with a revolving grindstone and roller, or its equivalent, placed opposite its grinding point, an interspersed table, with suitable recesses for holding the knife or other blank to be ground, and series of cams under said table, and operating in connection with the stone and the roller, substantially in the manner and for the purpose set forth.

**56,404.—STEAM ENGINE.**—H. Goodrich and G. R. Edwards, Shawneetown, Ill.

We claim the combination and arrangement of the movable piston heads, 888, with the piston rods, 12 12 12, ports, A A and B B, with the tubes, C C, pitmans, 456, and rock-shaft arm, I, substantially in the manner and upon the principle as herein set forth.

**56,405.—Suspended.**

**56,406.—IMPLEMENT FOR STRIPPING AND CUTTING SORGHUM.**—James Guckian, Camden, Ohio.

I claim an implement for stripping and cutting sorghum, and other analogous uses, constructed with a fixed blade, B, a movable blade or jaw, C, and a lever, D, or its equivalent, said parts being respectively constructed, and the whole combined for use, substantially as set forth.

**56,407.—MUSICAL ATTACHMENT TO BIRD CAGES.**—G. Gunther, New York City.

I claim the application to a cage, A, of a musical device, such for instance as an ordinary music box, in combination with a suitable lever, b, and bar, c, substantially as and for the purpose described.

**56,408.—COAL HOD.**—E. R. Hall, Buffalo, N. Y.

I claim the spout, B, constructed substantially as described, in combination with the cover, C, and ball, D, provided with cross-wire, e, or its equivalent, arranged and operating as set forth.

**56,409.—STEAM SAFETY VALVE.**—Edward Hamilton, Chicago, Ill.

First, I claim the combination and arrangement of the valve, e, provided with the stem, F, spiral spring, a, and set screw, E, with the case, D, all located within the case, A, as shown and described.  
Second, in combination with the valve, e, arranged as set forth, I claim the lever, G, arranged to operate as set forth.

**56,410.—FOLDING CHAIR.**—B. J. Harrison and J. Condie, New York City.

We claim the transverse bar, G, so arranged in relation with the pivoted back seat rail, C, the back, E F, and the legs, B, as to serve as a brace to hold the chair in position when the chair is opened, and as a handle by which the chair may be carried when closed, substantially as herein set forth.

Second, A folding chair of the crossed legs, B A, flexible seat, D, back, E F, pivoted back seat rail, C, and transverse bar, G, the whole constructed, combined, and arranged substantially as herein set forth.

**56,411.—RAILROAD.**—C. T. Harvey, Tarrytown, N. Y.  
First, I claim a coupling clutch for connecting the car, or other vehicle or body, to a moving cable which is joined so as to be capable of opening and releasing the cable, and has its divisions which clasp the cable or the heads thereof, so shaped as to become of less diameter toward the forward end, substantially as described.

Second, I claim joining the divisions of that part of a clutch which engage the cable so that they can be raised separately clear of the cable guide, substantially as described.

Third, I also claim a coupling clutch whose divisions swing on the rod on which the clutch slides in combination with springs, I I', or their equivalents, whereby the clutch, and the vehicle are relieved from sudden shocks when connected to a moving cable, substantially as set forth.

Fourth, I also claim the pendulous buffers for bringing a clutch into engagement with the cable, when the clutch is made in two or more parts, substantially as described.

Fifth, I also claim the cam shafts and their cams, G, in combination with the buffers, substantially as shown.

Sixth, I also claim lining the divisions of a divided clutch upon a rod or shaft parallel with the length of the car or other vehicle to which it is applied, substantially as described.

Seventh, The use of a hollow coupling clutch which connects a car or other vehicle to a moving cable, by embracing or straddling the cable and its ferrules, in combination with a shaft on which it slides, substantially as described.

Eighth, Placing an elastic cushion or cushions, or their equivalents, in the interior of the heads or ferrules of a moving cable, when such ferrules are joined, substantially as described.

Ninth, Giving a conical form to that part of the clutch which enters into the cable guide, so that when it receives one of the ferrules of the cable it lifts it out of frictional contact with the guide, substantially as described.

Tenth, Making the ends of the ferrules of the cable of conical form, substantially as described.

**56,412.—GATE.**—C. P. Hawley and E. B. Murdock, East Galway, N. Y.

I claim the levers, J K H L M, and connecting rods, N O R S and T U V W, constructed and arranged as herein described, in combination with each other, with the supporting posts, A B C, and with the gate, G, substantially as herein described and for the purpose set forth.

**56,413.—COMBINED PIANO, COUCH, AND BUREAU.**—Charles Hess, Cincinnati, Ohio.

I claim a combination of piano, couch, and bureau, arranged and operating substantially as represented and set forth.

**56,414.—PISTON FOR DEEP-Well PUMPS.**—J. W. Hoagland, New Brunswick, N. J.

I claim the combination of valve, G, rod, C, shoulder, B, neck, D, guards, I, and walls, E, arranged with a pump cylinder, and operating in the manner and for the purpose herein specified.

**56,415.—ERASER.**—A. H. Hook and H. B. Adams, New York City.

We claim forming erasers substantially as and for the purposes herein described.

**56,416.—STEAM WATER-POWER DEVICE.**—W. L. Horne, Batavia, Ill.

I claim the arrangement and combination of the float, d, chamber, S, condenser, n, perforated pans, y and q, slats, p, and connected by pipes, u and r, as herein described and for the purpose set forth.

**56,417.—FIRE ESCAPE.**—W. L. Horne, Batavia, Ill.

I claim the arrangement and construction of the windlass, E, with its ropes, H and J, square frame, C, with its rollers, G, when arranged and combined to operate as herein described.

**56,418.—ROLLER FOR CLOTHES WRINGERS, WASHERS, ETC.**—R. B. Hugunin, New York City.

I claim the elastic rollers herein described, made by vulcanizing rubber or equivalent gum, upon raw rubber, prepared cloth, or wire cloth, or both combined, the cloth being first wrapped around the central core, and the rods or their equivalents secured within the said cloth and grooves of the core, substantially in the manner and for the purposes specified.

**56,419.—LATHE FOR TURNING WHIP STOCKS.**—Liveras Hull, Charlestown, Mass.

I claim, for the purpose set forth, the combination as well as the arrangement of the two adjustable pattern bars, I K, the furcated levers, G H, the carriage, F, its ways or guides, E E, the mandrel, A, and chuck, C, or the equivalent of the latter, the cutter, q, and the self-adjusting Y piece, b; and I also claim the combination of the same and the slide, I o.

I also claim the combination and arrangement of the adjustable throat lever or piece, s, with the cutter, q, when applied to the upper furcated lever, so as to be adjustable thereon, as specified.

**56,420.—PISTON.**—Lafayette Huntoon, Milford, Mass.

I claim the combination of the separate springs, C C, with a connection, G, or its equivalent, substantially as described, whereby half of the excess of pressure of one spring may be transferred to the other, so as to equalize the pressure of both on the rings, as specified.

**56,421.—NEEDLE FOR CANING CHAIRS.**—Mrs. Mary E. Hurley, Baltimore, Md.

I claim a needle, A, for caning chairs, having an eye, b, through the front end, a, constructed and operating substantially as shown and described and for the purpose set forth.

**56,422.—ADJUSTABLE STORE SHELVES.**—S. L. Latta, Ligonier, Ind.

I claim, first, The adjustable cleats, C, and thumb-screw rods, E, operating on beveled guides, D, for the adjustment of the shelves, A A, substantially in the manner and for the purpose as herein specified.

Second, The screw lever rod, F, and screw nut, G, as arranged in connection with the shelves and operating in the manner and for the purpose substantially as herein specified.

**56,423.—COMBINED STOVE HOOK, HAMMER, ETC.**—Theodore C. Law, Green Island, N. Y.

I claim the household implement, combining the appliances, substantially as described.

**56,424.—CUTTER FOR WOOD-PLANING MACHINES.**—Chas. Livingston, Redwood City, Cal.

I claim the arrangement of the cutters, C and G, upon a suitable cutter head, having a wedge-shaped center piece, B, substantially as and for the purpose described.

**56,425.—CHURN.**—T. E. Lockwood, Cincinnati, O.

I claim the arrangement of spur wheel, F, pinion, E, crank shaft, D, and pitman, G, in combination with the adjustable lever, I, when provided with the series of apertures, K L and M, all arranged to operate substantially as and for the purpose herein described and set forth.

**56,426.—SAWING MACHINE.**—Donald R. MacLennan, Cincinnati, Ohio.

First, I claim the rocking socket, G, mounted directly on the drawing shaft, A, in combination with the guide rod, F, for the purposes specified.

Second, The arrangement of the lever, L, removable bracket, N, socket, n, rod, M, and roller box, K, relatively to each other and to the sawing apparatus, A B C D E, as and for the purposes set forth.

**56,427.—ARTIFICIAL HAND.**—J. F. Maguire, East Boston, Mass.

I claim connecting the fingers, D, of the hand, to and with the slide, R, having thumb nut, U, through angular lever arm, N, connecting rod, L, and cross head, F I, substantially as herein described and for the purpose specified.

In combination with the above, I also claim connecting the thumb, V, with the slide, R, through a spring arm, W, substantially as and for the purpose described.

**56,428.—STRAW CUTTER.**—Joseph Marchant, Cambridge City, Ind.

I claim the arrangement and combination of the balance wheel, A, adjustable plate wheel, B, thumb screw, C, rod, E, pawls, F and G, ratchet wheels, H H, and rocker arm or shaft, I, constructed and operating substantially as and for the purposes set forth.

**56,429.—FURNACE FOR PUDDLING, HEATING, ETC.**—Oscar F. Mayhew (assignor to W. H. Weeks, and G. M. Levette), Indianapolis, Ind.

First, I claim the construction and arrangement of the throat or opening, C, and air passages, F and H, when placed in such relation to the incandescent fuel as to operate in the manner and for the purpose substantially as set forth.

Second, The damper, G, in combination with the air passage, F, and throat, C, when arranged as and for the purpose substantially as set forth.

Third, The zig-zag divisions of the air passage, F, in combination with the throat, C, when arranged as and for the purpose substantially as set forth.

Fourth, The upper air passage, H, in combination with the throat, C, when arranged as and for the purpose substantially as set forth.

**56,430.—MACHINE FOR PLANTING COTTON SEED.**—I. W. McGaffey, of Chicago, Ill.

I claim, First, The rotating flanges in the seed box, for moving and agitating the seed, constructed and arranged in the manner and for the purposes specified.

Second, I claim the rotating fingers in combination with the flanges or agitators in the seed box, arranged and operated as shown.

Third, I claim the construction, arrangement, and combination of the fingers and adjustable slide for regulating the quantity of seed discharged, substantially as specified.

**56,431.—EXTRACTING BUNGS FROM BARRELS.**—Henry Myers, Hyde Park, and A. Webb, Scranton, Pa.

We claim a bung, A, provided with a staple, b, and depression, d, as a new article of manufacture.

Also, the hook, d, in combination with a screw or lever, and with the staple, b, in the bung, A, substantially as and for the purpose set forth.

**56,432.—RAILROAD SWITCH.**—T. S. Mitchell, Pittsburgh, Pa.

I claim, First, The automatic switch-moving apparatus composed of the bar, D, links, E F H, bar, I, levers, B R, shafts, r r, arms, S S, frames, T T, and weights, U U, or their equivalents, when they are arranged and operating as specified.

Second, The pieces of steel, V V, in combination with the rail, a', and frame, T.

Third, Operating a switch automatically by the action of the weight of the train itself on the frames, T T, in the manner described and for the purpose of preventing such train from running off the track.

**56,433.—QUARTZ MILL.**—Albert Moore, San Francisco, Cal.

First, in combination with the radial feeding furrows, B B B', I claim the plain surface beyond the ends of the furrows, substantially as described, for the purposes set forth.

Second, I claim the manner of breaking the joints in constructing and laying the shoes and dies, so that no continuous straight lines shall be employed from the feed center of the miller to its circumference, substantially as described and for the purpose set forth.

**56,434.—BROOM HEAD.**—W. B. Moore, Philadelphia, Pa.

I claim the combination of the cam or eccentric roller, with the bow, and with a lever for turning said roller to clamp the broom corn or other material between the bow and cam roller; and this I claim whether the lever for turning the roller be the screw for holding the broom, cap, and handle together, or whether it be a separate or removable lever, substantially as described.

**56,435.—PUMP FOR DEEP WELLS.**—W. E. Morrison and W. L. Betts, Funkville, Pa.

We claim attaching to the piston, or sucker rod of a pump, and above the upper valve, secured to it, a perforated receiver, substantially as herein described and for the purpose specified.

**56,436.—SOUNDING APPARATUS.**—S. E. and G. L. Morse, Harrison, N. J.

We claim, First, arranging fluids of different specific gravities in a vessel or vessels, so that when sunk in water, or submitted to pressure otherwise, a mark of the amount of compression of one or more of these fluids at the greatest depth, or at the point of greatest compression, is retained for inspection on the return of the instrument to the operator, substantially as described.

Second, We also claim the arrangement of two liquids having unequal specific gravities, with a meter tube, in a vessel closed except at one end of the meter tube, in such a way that external pressure, caused by the descent of the instrument in water, or otherwise, will force a portion of the lighter liquid through the heavier liquid, into the body of the vessel, to supply the vacancy there made by the compression of its contents, and that then, under a relaxation of the external pressure, caused by the ascent of the instrument in water or otherwise, the expansion or reaction of the liquids in the body of the vessel will force the heavier liquid into the meter tube, to the amount of the compression, thus forming a meter of the compression, and, by inference, of the greatest depth to which it has descended, substantially as described.

Third, We also claim the introduction of a minute quantity of air or other elastic fluid, into the vessel containing the liquids, as described in the clause next preceding, to make the instrument sensitive as a meter of depth in comparatively shallow water.

Fourth, We also claim the application to the bathometer of a meter tube, so constructed that the liquids can easily pass each other in the bore of the said meter tube, thereby enabling the operator to restore them to their original position for a new operation merely by turning the instrument, substantially as described.

Fifth, We also claim attaching a bag of india-rubber, or other suitable flexible material, to the outer end of the meter tube, for the purpose of preserving the exact quantities of the fluids in the vessel, as at first adjusted, and of enabling the operator, by pressure upon the bag, to discharge the contents of the meter tube into the vessel, and therefore to use a meter tube of small bore, substantially as described.

Sixth, We also claim attaching a buoy and weight to a bathometer in such a way that when the instrument, or its appendage, touches the bottom, the weight shall be detached, and allow the buoy to carry the instrument to the surface, substantially as described, thereby dispensing with a line.

Seventh, We also claim the method of releasing a submerged buoy, by causing a small weight attached to the long arm of a lever, to support on the short arm the larger weight, which sinks the buoy, till the smaller weight, touching the bottom, is supported thereon, thus causing the short arm, no longer counterpoised, to fall and discharge the greater weight, substantially as described.

Eighth, We also claim attaching to a bathometer a rod or pole in such a way that on its return to the surface of the water, it will attract attention at a distance so as to facilitate the recovery of the apparatus of which it forms a part, substantially as described.

**56,437.—SCAFFOLD.**—P. Newbanks, and H. M. Powel, Lincoln, Ill.

We claim the brackets as constructed in combination with the scaffold board, A, and traces H and G, the same being used substantially in the manner and for the purpose herein specified.

**56,438.—STAYS, SPRINGS, AND EXTENSORS IN WEARING APPAREL.**—J. L. Newton, Boston, Mass.

I claim as a stay, extensor or spring, in wearing apparel, raw hide cut in strips or otherwise adapted for giving stiffness to and supporting corsets, stays, waists, and skirts of dresses and other articles of wearing apparel, as and for the purpose above set forth.

**56,439.—HORSE HAY FORK.**—Frederick Nishwitz, Williamsburg, N. Y.

First, I claim the combination with the shank, the tine and the traversing bar of the sliding collar, G, all arranged and operating substantially as described.

Second, I claim the combination with the shank and traversing

bar of the locking lever, when constructed and arranged as and for the purpose described.

**56,440.—HORSE HAY FORK.**—F. Nishwitz, Williamsburg, N. Y. and B. S. Heyers, Pekin, Ill.

First, We claim the combination in a horse hay fork of two S-shaped prongs or tines pivoted near their centers to move in parallel planes, so arranged that when entering the hay, the lower arms of the tines unite to form a spear to penetrate more easily, and when expanded, the hay is grasped in two separate bundles between the lower arm of one prong and the upper arm of the other respectively, substantially as described.

Second, The arrangement of the tines, pivoted on opposite sides of the rigid shank or draw-bar, as described, for the purpose of avoiding clogging.

Third, The combination of the tines, pivoted to the shank with the sliding collar, toggles and stops, substantially as described, for the purpose of locking the tines when hoisting.

Fourth, The combination with the shank, the tines and the sliding collar, and the toggle links, when arranged to operate as a stop to limit the backward movement of the tines in entering the hay, substantially as described.

**56,441.—FENCE.**—A. W. Olds, Green Oak, Mich.  
I claim the braces, E E, when secured to the uprights, B B, as described, in combination with the upper rail and binding wire, H, as and for the purpose set forth.

**56,442.—WASHING MACHINE.**—Norman Olin and E. L. Hopkins, Homer, Mich.

We claim the combination with each other of the endless belt or apron, D, passing over the rollers, B, the rubber, E, shaft, F, carrying the rollers, G G', and the springs, I I, arranged and operating substantially as described.

**56,443.—MACHINE FOR FOLDING FLEECES OF WOOL.**—John Porter, Ruggles, Ohio.

I claim the sectional table, B B', C C', and leaf, L, in combination with the brace, G, strap, L, and roller, E, when arranged in the manner and for the purpose set forth.

**56,444.—ROOFING CEMENT.**—Wm. L. Potter, Clifton Park, N. Y.

I claim an improved composition for roofing and similar uses, formed by mixing raw coal tar and powdered clay with each other, substantially in the manner described and for the purpose set forth.

**56,445.—TENON MACHINE.**—William Pruet, Kokomo, Ind.

I claim, First, The hereinabove described device for feeding the tail block toward the cutters with the upward motion of the cross head, by means of the lever, G, cam lever, C, rod, P, teeth, Q, and pawl, P', attached to the tail block, N, the said several parts being constructed, and the whole arranged for use, substantially as set forth.

Second, In combination with the knives, L and K, so arranged as to cut the shoulders and sides of the tenon at the same time, I claim a device for giving a forward feed to the tail block, actuated by the same lever that communicates motion to the knives, substantially in the manner set forth.

**56,446.—BROOM HEAD.**—M. Quinby and J. C. Sturdevant, Skinner's Eddy, Pa.

We claim the movable jaw, H, furnished with a hinge, A, and a shank, C, in combination with the stationary jaw, G, binders, D D, and screw, B, as described and for the purposes set forth.

**56,447.—HAT.**—C. L. Rahmer, Brooklyn, N. Y.

I claim the combination of the band, a, and bent arms, v, with the sweat lining, B, applied to the hat, A, forming the space, f, all in the manner and for the purpose herein specified.

**56,448.—SOCKET COUPLING FOR GAS FIXTURES.**—Thomas L. Reed, Providence, Rhode Island.  
Antedated July 13, 1866.

I claim forming the packing of the coupling with two flanges and an intervening space externally, and a swelling ridge, internally, substantially as described for the purpose specified. I also claim making that flange of the packing by which it is confined in the shell of some comparatively inelastic material, substantially as and for the purpose specified.

**56,449.—CLOTHES WRINGER.**—Orrin Reeves, Greenport, N. Y.

I claim the steel springs, S S, and the adjustable journal box, g, the rollers, G G, and friction rollers, B, the several parts being constructed, combined and arranged, as and for the purpose herein described and represented.

**56,450.—PADLOCK.**—Cyrus W. Saladee, Newark, Ohio.

First, I claim as constructed the tumbler, "A" with the guard ring, C, attached as described, and operating as set forth, in combination with the spring, E, for the purposes set forth and described.

Second, I claim the key stud, X, and short stud, S, on tumbler, "A" constructed as described and for the purposes set forth.

**56,451.—PADLOCK.**—Cyrus W. Saladee and William Armstrong, Newark, Ohio.

First, We claim the wheel hasp, A, or its equivalent, constructed and operating in the manner and for the purpose substantially as shown and described.

Second, We claim the center pin or pivot, C, in combination with the wheel hasp, A, in the manner and for the purpose substantially as shown and described.

Third, We claim the shoulder, H, or its equivalent in combination with the hasp, A, spring, B, or its equivalent, in the manner and for the purpose substantially as shown and described.

Fourth, We claim locking the wheel hasp, A, by taking hold of the notch, O, or its equivalent, in the manner and for the purpose substantially as shown and described.

**56,452.—SAFE.**—Rufus S. Sanborn, Ripon, Wis.

First, I claim the combination of the case, A, with the cylinders, B C D, constructed and arranged substantially as and for the purpose herein specified.

Second, The use of the vessels for holding water when used in connection with the cylinders as herein fully set forth.

Third, The arrangement of the box, E, with the cylinders and outer case, A, substantially as and for the purpose herein set forth.

**56,453.—MANUFACTURE OF LAGER BEER.**—John Schneider, Williamsburgh, N. Y.

First, I claim the above described process and production of an improved lager beer, substantially as described and set forth.

Second, I claim the peculiar manner of extracting the essence or flavor of hops by means of the boiling wort or unfermented beer, and mixing the same with the fermented beer for the purpose substantially as set forth and described.

**56,454.—COMBINED SEEDER AND CULTIVATOR.**—Silas C. Schofield, Freeport, Ill.

First, I claim the bifurcated double cam rod, H h h, suspended by a swinging link, k, and operated by an odd number of pins, 11, substantially in the manner and for the purpose set forth.

Second, I claim the combination of the agitating rock shaft, J, with an actuating cam rod, H, substantially in the manner and for the purpose specified.

Third, I claim the compound lever, M m, for operating the seed slide, r, as herein shown and explained.

Fourth, I claim the stay braces or re-enforcing rods, e e, in combination with extended axle ends, f f, when employed as draft wrists for attaching the outside plow beams, E E, substantially in the manner and for the purpose set forth.

**56,455.—PEN AND ERASER COMBINED.**—Joseph Schott, Chicago, Ill.

I claim the combination of the folding drawing pen with sliding eraser, the whole arranged as above described and for the purpose herein specified.

**56,456.—BALING PRESS.**—Leopold Seeberger, and N. Levy, Cincinnati, Ohio.

We claim, First, The provision in a baling press of the sliding shaft J, so arranged as to allow a fast or slow motion of the

follower, by coupling or uncoupling a train of spur wheels, D E F G, and pinions, c d e f g, in the manner described and set forth.

Second, We claim a baling trunk, all of whose sides, T, are hinged to the bottom or floor, R, of said trunk, in the manner specified.

Third, In combination with the elements of the clause immediately preceding, we also claim the staples, U, catches, V, and stops, W, all arranged and operating as and for the purpose described.

**56,457.—MACHINE FOR POLISHING ENAMELED PAPER.**—S. Shepherd and A. M. George, Nashua, N. H.

We claim, First, The combination of the metallic burnishing roller, G, endless apron, F, and table, B, when the burnishing roller revolves at a higher velocity than that of the endless apron, substantially as herein set forth for the purpose specified.

Second, Providing an elastic tie bearing for the paper under the burnishing roller by making either the apron or the table elastic, substantially as herein set forth.

Third, Giving the burnishing roller, G, a reciprocating movement transversely to the endless apron simultaneously with its rotary motion, substantially as herein set forth for the purpose specified.

Fourth, The pressing plate, T, applied in relation with the burnishing roller, G, endless apron, F, and table, B, substantially as herein set forth for the purpose specified.

**56,458.—BEVERAGE.**—Henry Smith and Hiram F. Snow, Dover, N. H.

We claim a beverage prepared from the ingredients and substantially in the proportions and manner herein specified.

**56,459.—HOLLOW AUGER.**—J. H. Smith, Pineville, Pa.

I claim the frame or stock A, and the two adjustable jaws, D D', operated by the right and left screw, F, and the cutter, G, all constructed and arranged to operate in the manner substantially as and for the purpose herein set forth.

**56,460.—SCREW WRENCH.**—Atkins Stover, New York City.

I claim, First, The traveling worm, F, fitted upon the rod, E, and working in a screw thread made upon the back of the bar of the wrench, in combination with the movable jaw, C, and bar, A, substantially as specified.

Second, The combination of the rod, E, worm, F, slot, e, pin, f, movable jaw, C, bar, A, and stationary jaw, B, substantially as shown and described.

**56,461.—BROOM HEAD.**—W. Paine and R. E. Cavinness, Fairfield, Iowa.

We claim the plate, A, having the flanges, a, and the teeth, t, hinged to the handle by means of the staples, C, in combination with the clamps, w, and bolt, D, all arranged as shown and described.

**56,462.—HARNESS.**—Washburn Peabody, Dixmont Center, Maine.

I claim the arrangement substantially as described of the two rump hooks, A A, with the back strap of a harness, the same being for the purpose specified.

**56,463.—ADJUSTABLE HAND CUFF.**—O. C. Phelps, New York City.

I claim the spring f, spiral spring, g, and sliding bolt, e, arranged so that said bolt shall catch into notches on the inner or concave side of the bow, or long section, a, substantially as described.

**56,464.—EVAPORATOR.**—E. W. Taylor, Franklin, Ind.

I claim the reversing of the heat from the furnace, which heat plays on the bottom of the pan and passes through the pan, C, by means of small flues.

I claim the regulating of the heat by means of the shut-offs H and N.

I also claim the drum, E, and the movable connection flues, L L and c, and the stationary ones, M M and c.

**56,465.—PORTABLE PICKET FENCE.**—A. L. Thorp, Vandalia, Mich.

I claim the slots, a, in the rails, A, as constructed, and the picket, b, as arranged therein, in combination with the cross-pieces, D, as constructed, substantially in the manner and for the purpose as herein set forth.

**56,466.—REVOLVING FIRE-ARM.**—William Tibbals, South Coventry, Conn.

First, I claim recessing the front face of the breech, B, to receive the smaller rear end of the cylinder, D, when said recess is provided with the annular flange, c, substantially as shown and described.

Second, I claim the removable anvil, a, or its equivalent, when constructed and arranged to operate as and for the purpose set forth.

Third, I claim the annular flange, c, or its equivalent, whether used with or without the anvil, a, for the purpose of holding the cartridge in the cylinder, as described.

**56,467.—RAILROAD-STATION PUMP.**—A. W. Todd, Chicago, Ill.

I claim the arrangement of the cylinder, B, with the stay rod, I, cork, n and o, cock, E, spigot, J F, handle, H, being secured to the cylinder B at K, pipe, C, substantially upon the principles, and in the manner herein set forth.

**56,468.—PUMP.**—F. W. Tully and T. Reece, Philadelphia, Pa.

First, We claim the combination of the disk, I, with its slots, L L', blocks, 11, and vibrating link, N, with a single or double-acting lift and force pump, constructed substantially in the manner set forth.

Second, The crab or saddle, D, with its fixtures, d and e, in combination with the foregoing, and with the pipe, C, for attaching and giving support or steadiness to the pump, substantially as described.

**56,469.—WASHING MACHINE.**—Philip Van Bussum, Henderson, Ky.

I claim the slatted rotating or semi-rotating cylinder, B, in combination with the concave, E, formed of the parts, e, e, connected by hinges, f, and attached by hinges, g, to arms, h, projecting from shafts, F F, and having a weight, H, applied, all arranged substantially in the manner as and for the purpose set forth.

**56,470.—CALENDAR.**—W. Powell Ware, New York City.  
Antedated June 29, 1866.

I claim the dial, b, containing the days of the month in seven radiating columns, the dial, a, denoting the days of the week, and the dial, c, indicating the months, and visible through an opening in the dial, b, when constructed and arranged in the manner and for the purposes herein set forth.

**56,471.—BURGLAR ALARM.**—R. M. Webb, New York City.

I claim the combination of the tube, E, rod, F, having a swiveled piece, J, and spiral or other suitable spring, H, with the key hole of a lock or door, when arranged together and with regard to such key-hole, and connected to a bell or other alarm, so as to operate substantially in the manner and for the purpose described.

**56,472.—MACHINE FOR FLUTING WASH-BOARDS.**—Calvin J. Weld, West Wardsboro', Vt.

First, I claim the feeding arm, V, attached to the feeding shaft, P, in combination with the slot, Z, in which it moves, for feeding the blanks for a new cut during the return movement of the carriage, substantially as described.

Second, I also claim the springs, R R, for lifting the carriage out of gear at the end of its forward movement, in combination with the lugs, b b', and slots or recesses, c, in the top rail of the boxes, S S, substantially as described.

Third, I also claim the combination of the springs, R R, for lifting the carriage, with the spring, U, for effecting its return movement, substantially as described.

Fourth, I also claim the stop lever, W', with its stops, W, made and operated as shown, in combination with the adjacent holder, M, substantially as described.

**56,473.—STOVE-PIPE DRUM.**—C. C. Webber, Calmar, Iowa.

I claim an adjustable pipe, F, operated by the rod, G, or its equivalent, and employed in conjunction with the flues, A B C, and damper, D, to make a direct or indirect communication through the drum, as and for the objects specified.

**56,474.—LOOM.**—Joseph Welsh, Philadelphia, Pa.

I claim giving the described different motions to the heddles of the loom, for the purposes specified, by means of the hooked cords or straps, A B, on the roller, C, or their equivalents, operating in combination with the pulley, E, or its equivalent, substantially as and for the purposes described.

**56,475.—HORSESHOE.**—Albert S. Wilkinson, Pawtucket, R. I.

I claim the combination of the shoe, A, and web, B, having its inner edges curved, in the manner and for the purpose set forth.

**56,476.—HORSESHOE.**—Albert S. Wilkinson, Pawtucket, R. I.

First, I claim the metal plate, A a, in combination with the rubber or other elastic sole, D, and rivets, c c', as illustrated by figures 1 and 2, of sheet 1, substantially as described.

Second, I claim the hidden calkins, e e c, operating substantially in the manner and for the purpose set forth.

**56,477.—HORSESHOE.**—Albert S. Wilkinson, Pawtucket, R. I.

I claim the bar, A, in combination with the toe clip, a, and heel clips, a1 a2, as indicated in figures 1 and 2, the whole being constructed and operated substantially in the manner and for the purpose set forth.

**56,478.—(A)—STENCH TRAP.**—F. H. Williams, Syracuse, N. Y.

I claim the siphon, B, provided with a floating valve, E, in combination with the sink or sinks in a house or building and with the pipe or pipes leading to the sewer, substantially as and for the purpose described.

**56,479.—(B)—STENCH TRAP.**—F. H. Williams, Syracuse, N. Y.

I claim the inclined apron, C, tray, D, and valve, E, in combination with the sink, A, constructed and operating substantially as and for the purpose described.

**56,480.—ORE AND TIMBER CAR FOR MINES.**—George Williams, Sterling, Colorado.

I claim, First, The construction of the doors with a wider portion, b, to adapt them to be supported by the sides of the car, substantially as described.

Second, A car constructed with end doors adapted to be folded over the top for the purpose of converting it into a timber car.

Third, In combination with the above a trigger C, provided with an inward projection, adapted to be tripped by the post, D.

**56,481.—ELEVATOR.**—George Williams, Sterling, Colorado.

First, I claim the elevating bucket, E, with the discharging levers, F F, applied to the bottom of the bucket, substantially as described.

Second, And in combination with the above, I claim the deflecting rollers, D, and curved guide ways, K K', arranged and operating substantially as described.

Third, I claim the adjustable sections, J', employed to enable the bucket to be discharged at different heights, substantially as described.

Fourth, I claim the hinged chute, O', in combination with the levers, O2 and p, operating substantially in the manner and for the purpose described.

Fifth, I claim the bucket, E, in combination with the hook, W or its equivalent, the roller, V, substantially as described.

**56,482.—TRUNK.**—L. H. Wolf, Detroit, Mich.

I claim as a new article of manufacture intended for a cleat for a trunk, made of metal and constructed substantially in the manner above described.

**56,483.—APPARATUS FOR APPLYING LIQUIDS TO CASKS.**—James O. Woodruff, Albany, N. Y.

First, I claim the process for applying liquids to the interior of casks so as to penetrate into the pores of their bodies, by the employment of condensed air cold or at the temperature of the atmosphere, as described.

Second, The apparatus described in the within specification to effect the process of forcing liquids into the pores of cask bodies, that is, the frame, B, suspended on its axis, E, the disks, C, with their screw rods, R, the flexible tube, H, with its nozzle, J, and tube, k, substantially as described and for the purposes set forth.

**56,484.—SPRING BED BOTTOM.**—Joshua Barnes (assignor to Isaac A. Singer), New York City.

First, I claim in combination with a bed slat a wire spring having two parallel coils at the base and two parallel coils at the top, the coils at the base, C, turning adversely to those at the top, B, substantially as above described.

Second, In combination with the two adverse springs, I claim the hook or hinge, substantially as above described and for the purposes set forth.

Third, The combination of the cross bar, I, rod, E, pin, D, and slat, A, with the wire springs, as above described.

**56,485.—MACHINE FOR MAKING CORDAGE, WEBBING, ETC.**—James A. Bazin, Canton, Mass.

(assignor to himself, A. B. Hall, West Roxbury, Mass.), C. Scott, and W. J. Town, Newton, Mass.

First, I claim, in a machine for making cordage, webbing, and other similar fabrics, so actuating the spools by mechanism, consisting essentially of the revolving platform, K, furnished with a series of gears, L M N, sliding plates, P, and recesses, O, in combination with the toothed ring, B, and a series of carriers, V, with their spool frames, that each stand will be carried around two stationary ones, and thereby form an interlocking twist, as set forth.

Second, I also claim the above-described mechanism in combination with the rack, W, for the purpose described.

Third, I also claim the sliding plates, P, operated by a cam wheel, Q, in combination with the platform, K, and a series of carriers, V, with their spool frames and spools, operating substantially as set forth.

Fourth, I also claim the combination of the gear, L, with its shaft, b, gears, S R, and cam wheel, Q, for operating the sliding plates, P, as described.

Fifth, I also claim adjusting the cam wheel, Q, by means of the eccentric pin, s, on the gear, R, as set forth.

**56,486.—CASTER BOTTLE.**—Burroughs Beach (West Meriden, Ct.), assignor to himself and E. A. Thorp, North Haven, Ct.

I claim the combination, with a caster bottle, of a shaft or spindle extending through the same in the direction of its length, and arranged to be turned therein in the manner and for the purpose described.

**56,487.—QUARTZ MILL.**—Smith W. Bullock, Elizabeth, N. J., assignor to the Bullock Ore Dressing Machine Company, New York City.  
Antedated July 3, 1866.

I claim, First, The combination of the rotating trough, D, with the crushing wheels, G G, and gear wheels, E and F, so as to govern the rotary motion of the trough while its vertical action is independent of, and disconnected from, the gear wheels.

Second, I claim the application of springs to the adjustable bed, so arranged as to form a binding link or tie between the supports of the crushing wheels, G G, and the supports of the trough, D, each of the several features being arranged and operating substantially as and for the purposes herein set forth.

**56,488.—BOILER FOR COOKING STOVE.**—Esek Bussey, (assignor to himself and Chas. A. McLeod), Troy, N. Y.

First, I claim a water reservoir, or tank, constructed of cast



**W. H. BULLOCK, PATENT OFFICE MOD-**  
el Maker, No. 147 East Madison street (Between Clark  
and LaSalle streets), Chicago, Ill. 52\*

**THE NONPARIEL WASHING MACHINE.**—  
"A First-class Machine—one that has no rival to our knowl-  
edge."—Scientific American.  
Send for free descriptive circular to  
OAKLEY & KEATING,  
184 Water street, New York. 51f]

**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 lying idle after Aug. 15, 1866.  
BULLARD & PARSONS,  
Nos. 23 and 25 Potter street, Hartford, Ct. 5]

**ON HAND, FOR SALE—THE BEST PATENT**  
Horse-power machines made; also, Cotton Gins. Parties  
wishing for machinery of any kind will do well to address  
J. R. ABBE, Providence, R. I. 1]

**EMPLOYMENT—"PLEASANT AND PROF-**  
ITABLE." Agents wanted to sell New Physiognomy—1000  
engravings, price \$5.—and other illustrated standard works.  
Send stamp for terms, to  
FOWLER & WELLS, New York. 54]

**DRILL CHUCKS, OLMSTED'S PATENT,**  
will be forwarded to any address on receipt of price.  
Price:—No. 1, opens 1/2-in., \$7. No. 2, opens 3/4-in., \$5.50.  
Illustrated in the Scientific American of July 7th. The trade  
generally are supplied.  
L. H. OLMSTED,  
Stamford, Conn. 52]

**TO OLD AND YOUNG.**—  
For 30 cents and stamped addressed envelope, I send mate-  
rials for 5 beautiful Magic Photographs. With a few drops of  
water a child can make them. Address  
THEODORE E. KING,  
Landscape Photographer, Cambridge, Mass. 52]

**FIRST-CLASS TOOLS.**—  
36-in. and 25-in. Lathes, 32-in. and 24-in. Planers, Radial and  
Upright Drills, and 10-in. Shapers, finished. 20-in. Lathes, Boring  
and Chucking Lathes, 18-in. Shapers, and Horizontal Drills mak-  
ing.  
E. & A. BETTS,  
Wilmington, Del. 53]

**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 pre-  
miums offered, will be furnished at the Office of the Commis-  
sioners, on application in person or by post.  
HAMILTON HARRIS, Albany,  
JOHN V. L. PRUYN, Albany,  
O. B. LATHAM, Seneca Falls,  
Commissioners. 55]

**WOOD & MANN STEAM ENGINE CO.'S**  
CELEBRATED PORTABLE STEAM ENGINES, from  
4 to 55 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 Port-  
able Engines and Saw Mills, which, for simplicity, compactness,  
power, and economy of fuel, are conceded by experts to be supe-  
rior 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. De-  
scriptive circulars, with price list, sent on application.  
WOOD & MANN STEAM ENGINE CO.,  
552] Utica, N. Y. Branch office, 96 Maiden Lane, N. Y. City.

**SCHOOL OF MINES, COLUMBIA COLLEGE,**  
EAST 43TH STREET, NEW YORK.  
Faculty:  
F. A. P. BARNARD, S.T.D., LL.D., President.  
T. EGGLESTON, 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. Per-  
sons not candidates for degrees are admitted without examination,  
and may pursue any or all of the subjects taught. The next ses-  
sion begins October 1, 1866. The examination for admission will  
be held September 28, 29. For further information, and for cata-  
logues, apply to  
DR. C. F. CHANDLER, Dean of the Faculty. 58\*]

**MACHINISTS.—EVERY MACHINIST** should  
have one of McCarty's Mechanical Series. No. 1 is now  
ready, entitled "Manual of Screw Cutting," containing rules for  
calculating the gears for a Screw Cutting Lathe, with two gears,  
and with four; also, fractional threads. Price 25 cents. Sent free  
by mail to any address on receipt of 30 cents. Machinists' Direc-  
tory. Price 15 cents. "Manual of Screw Cutting," \$2 per dozen,  
free by mail. Agents Wanted. Address  
JAMES CAMPBELL, Scientific Bookseller,  
18 Tremont street, Museum Building, Boston. 1\*]

**COPPER VACUUM PANS FOR SALE.**—  
One of 6-feet diameter, and one of 52-in., with air pump com-  
plete. Apply to  
GRAVES & PIER,  
276 Water street, New York. 54\*]

**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. 57]

**WROUGHT IRON TACKLE BLOCKS.**—  
all sizes. Also, Doyle's Patent Hoisting Machines, on  
hand, for sale by  
LEACH BROTHERS,  
102 Liberty street, New York. 513]

**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.,  
31 Exchange street, Boston, Mass. 512]

**STATE RIGHTS OF A VALUABLE PATENT**  
For Sale. Apply to S. HARTSHORN, No. 62 Center street. 1\*

**A GOOD SET OF SECOND-HAND TIN AND**  
and Sheet-Iron Tools, Patterns, etc. Terms cash. For par-  
ticulars and description, address  
GEO. G. ATWOOD,  
Geneva, N. Y. 42\*]

**BROUGHTON'S PATENT GAGE COCKS,**  
Graduating Lubricators, Transparent Oil Cups, Warranted  
the best in the Market. Sold, Wholesale, by John Ashcroft, Todd  
& Rafferty, Woodward Steam Pump Co., and all large dealers.  
513] BROUGHTON & MOORE, Manufacturers, New York.

**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. 48\*]

**MACHINERY AND MACHINISTS' TOOLS,**  
all kinds, including the LEONARD & CLARK PREMIUM  
LATHE. Also, Steam Engines, Saw Mills, Wood Cutting Machin-  
ery, etc., etc. Steamboat and Machinery Repairing at the  
QUASSAICK MACHINE SHOP, Newburgh, N. Y. 48\*]

**IMPORTANT TO BLACKSMITHS.**—The most  
Economical and valuable Bolt-Heading Machine in the world,  
at a price within the reach of every blacksmith—only \$120. A  
Wonderful Labor and Time-Saver. Send for Circular to  
L. E. OSBORN, Sec'y "Davis Bolt-Heading Machine Co.,"  
New Haven, Conn. 45\*]

**WINTER'S IMPROVED CIRCULAR SAW-**  
MILL, and appurtenances, with Lane's Patent Set and  
Feed Works.  
The Brooklyn Saw-Mill Company write, May 5, 1866: "We  
have in use Winter's Mill, with Lane's Patent and Emerson's In-  
dependent Tooth Saw, and regard them superior to any other in  
use, and among the greatest improvements of the age."  
Pamphlets furnished.  
WINTER & CO.,  
No. 40 Broadway, New York. 44]

**LITTLEFIELD'S PATENT SCAFFOLDING.**  
One of the simplest and best contrivances for Builders and  
Painters that has ever been invented, is the Scaffolding recently  
patented by the subscriber.  
The utility and simplicity of this scaffolding, and the safety and  
ease with which it is adjusted, recommends it to all who have  
occasion to use the article. State, County, or Single Rights for  
sale low. Address  
HORACE LITTLEFIELD,  
Lewis Cass county, Iowa. 43\*]

**T. N. HICKCOX,**  
Manufacturer of  
STAMPED AND PRESSED BRASS GOODS,  
Lamp and Lantern Trimmings, Plain and Fancy Brass Caps for  
Pomatum and Mucilage Bottles, Baggage and Key Checks, etc.  
Labels for Oil Cans, Stoves, House Furnishing Goods, Insurance  
Companies, etc. Steel Dies of any Design Required. Manufactured  
on the premises, by experienced workmen, under the most care-  
ful supervision; Presses and Light Machinery manufactured to or-  
der. Brass Goods Dipped, Lacquered, Silver-Plated, etc. 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, cor. John and Pearl-st., Brooklyn. 44\*

**NEW BRICK MACHINE.**—  
In successful operation since 1854. Common labor, with one  
brick maker only required. Worked by one man, makes 4,000  
per day; by horse, 7,000 to 12,000; by steam, 15,000 to 25,000. Cost  
from \$100 to \$600.  
DRYING TUNNEL, Patented 26th February, 1861, for "drying  
bricks, tile, pottery, cores for castings, and other manufactures of  
clay and sand; grain, fruit, vegetables, pea nuts, lumber, glue,  
starch, whitening, sugar, hogasses, guano, leather, hides, fish, meat,  
salt peter, alum, and other chemicals." Bricks molded one day  
are set in the kiln the next. For further particulars, in a pam-  
phlet, giving full instructions on brick setting and burning with  
wood or coal, address, sending fifteen cents.  
FRANCIS H. SMITH, Box 556, Baltimore, Md. 44\*

**A RARE CHANCE FOR INVESTMENT.**  
A Manufacturing Firm, having added to their business an-  
other branch—the manufacture of a new and popular utensil  
needed in every family—and themselves, from want of capital and  
facilities, unable to meet one-tenth of the rapidly increasing de-  
mand, and purpose to dispose of the business. They will either  
sell out the business and patents, or they will put the business in-  
to a Stock Company, or give license to manufacture, for a reason-  
able royalty on each utensil made.  
The profits are large, demand unlimited, business strictly cash,  
and monopoly secured by two patents dated respectively Nov.  
1865, and March, 1866. Papers and Books can be shown, demon-  
strating that from 25 to 40 per cent on the capital invested can be  
made every three months.  
Parties wishing to investigate further will address  
A. B., Box 335, Syracuse, N. Y.  
Giving address and the amount they would wish to invest. 42]

**STIMPSON'S SCIENTIFIC STEEL PENS,**  
Patented March 20th, 1866. Agencies wanted in every city of  
the Union. Retail price \$2 per Gross. Liberal discount to the  
Trade.  
WM. B. STIMPSON,  
12\*] General Agent, 37 Nassau street, Room 38, New York.

**FABRICATION OF VINEGAR.**—Prof. H. Dus-  
sauce, Chemist, is ready to furnish the most recent French  
processes to manufacture Vinegar by the quick method, with and  
without alcohol, directly from grain, etc. For further infor-  
mation address 15 Avenue Bugeaud, Paris, France. 1\*

**BRAYTON'S SAFETY STEAM GENERATOR**  
AND ENGINE.—A Perfect Success.—By this invention the  
long sought-for object has been accomplished; to wit: A means  
by which Steam can be Generated safely, so that there shall be  
no more danger from explosion than with the hot-air engine, and  
at the same time retain all the power of the steam engine. This  
much sought-for result has at last been accomplished, and after  
many severe tests we feel fully warranted in offering this Steam  
Generator and Engine to the public as a perfectly safe power, and  
at the same time a cheap power. As a generator of steam for  
heating buildings, etc., there is not its equal in use. For further  
information or circular, address R. A. HUTCHINSON, Agent,  
No. 8 Dey street, New York. 33\*]

**TWO POWERFUL HYDRAULIC PRESSES**  
For Sale by  
T. W. KRAUSE,  
74 and 76 West Washington street, Chicago, Ill. 26 cow 5\*]

**MASON'S PATENT FRICTION CLUTCHES,**  
for starting Machinery, especially Heavy Machinery, with-  
out sudden shock or jar, are manufactured by  
VOLNEY W. MASON, Providence, R. I. 33\*]

**FOUNDRY AND MACHINE SHOP FOR**  
SALE. In Good Running Order, with good, durable water  
power. For particulars, address Post-office box 346, Jamestown,  
New York. 26\*

**NEW PHYSIOGNOMY; OR, SIGNS OF**  
Character as manifested through Temperament and External  
Forms. With 1,000 Illustrations. By S. R. WELLS, of the PHRE-  
NOLOGICAL JOURNAL. One handsome 20mo volume, 768 pages  
postpaid, \$5. Agents wanted.  
FOWLER & WELLS, No. 389 Broadway, N. Y. 33]

**IMPORTANT TO MANUFACTURERS AND**  
Inventors.—SMITH & GARVIN, No. 3 Hague street, New  
York, Machinists and Model Makers, are now ready to make pro-  
posals for building all kinds of Light Machinery, Manufacturers'  
Tools, Models, etc. Satisfactory reference given. 266\*

**INCRUSTATIONS PREVENTED BY WINANS'**  
Incrustation Powder. Cost \$3 to \$5. 11 Wall-st., N. Y. 1\*

**COTTON MACHINERY FOR SALE BY THE**  
HARRISBURG COTTON MILL COMPANY,  
Harrisburg, Pa.  
Two (2) 30-inch Pickers, one Beater each, strong Machine Iron  
frame, in good working order.  
One (1) 30-inch Picker, two Beaters, New—rebuilt.  
Four (4) 30-inch Pickers, two Beaters each.  
One (1) Willey, or Cotton Opener, New, with Trunk.  
One (1) Willey, or Cotton Opener.  
Six (6) Railway Heads, four Rolls each.  
Eight (8) Drawing Frames with Collers, four Deliverers each,  
with spare Rolls, Stands, etc.  
One (1) Cloth Folding and Measuring Machine, in good order.  
One (1) Reel—45 Spindles—New and Good.  
One (1) Taunton Speeder.  
One (1) Baling Machine for Yarn or Carpet Chain. 34\*

**ORDERS FOR BELT STRETCHERS.**—  
Capable of taking in a 12-inch Belt—filled on Sight of Order.  
Other Sizes put up on Short Notice.  
WILL SELL THE ENTIRE RIGHT LOW.  
Send for Circular. [34] SEYMOUR ROGERS, Pittsburgh, Pa.

**PATTERN & MODEL MAKERS,**  
Gearing Cocks, Valves, and Engines Patterns of every de-  
scription.  
COTTON GINS! COTTON GINS!! COTTON GINS!!!  
Improved Double or Single-roller Sea Island Cotton Gins con-  
stantly on hand. Apply to ANDERSON & SCHERMERHORN,  
Rear of 47 Ann street, New York. 33\*

**CAMDEN TUBE WORKS (OFFICE AND**  
Manufactory Second and Stevens streets, Camden, N. J.)  
Manufacturers of Wrought Iron Welded Tube of all sizes; Force  
Improved Gas Pipe Screwing Machines for both Hand and Power;  
Pipe Vises, Stocks, Dies, Taps, Reamers, Tongs, and all other tools  
used by Steam and Gas Fitters. Also, Upright Drill Presses for  
both Hand and Power, constantly on hand, and ready for deliv-  
ery. 24\*

**THE MOST VALUABLE MACHINE FOR**  
Builders and Carpenters, Furniture, Carriage, Agricultural  
Implement, Sash and Door, Walwed and Straight Molding,  
and Piano Manufacturers, complete for all kinds of irregular and  
straight work in wood, hard or soft, superior to all others, having  
the capacity of 30 good mechanics, called the Variety Molding  
and Planing Machine. We own 9 patents covering the valuable  
inventions for machines with upright mandrels. We hear there  
are parties manufacturing machines infringing on some one or  
more of our patents. We caution the public from purchasing  
such infringements. Our patents secure to us the machine with  
either iron or wooden table through which are two upright man-  
drels, having cutters in each head held by a screw nut; also,  
combination collars, saving 75 per cent in cutters, feed table to  
plane and cut, irons outside the cutters, preventing wood from  
taking undue hold. Also guards acting as plane stocks, making  
it safe for a boy to run.  
These machines are manufactured for America and Europe,  
only at the Hamilton Machine Works, No. 211 East Twenty-second  
street, New York. Address COMBINATION MOULDING and  
PLANING MACHINE CO., 211 East 22d-st., New York. Agents  
solicited. Send for circular giving full description. 13\*

**FOR PATENT SCROLL SAWS, PATENT**  
Power Mortising Machines, Tenoning, Boring, and Dowelling  
Machines, Sash, Blind, and Door Machinery, of the latest and  
most improved description, address J. A. FAY & CO., Cincin-  
nati, Ohio. 6dttf

**WOOD-WORKING MACHINERY, THE SUB-**  
SCRIBER is Agent in New York for J. A. Fay & Co., C. B.  
Rogers & Co., Ball & Williams, Richardson, Merriam & Co., H. B.  
Smith, Gray & Woods, Lane & Bodley, D. Doncaster, and all other  
manufacturers of Wood-working Machines.  
S. C. HILLS, No. 12 Platt street. d

**IMMENSE IMPROVEMENT IN STEAM.**—W  
C. HICKS'S PATENT STEAM ENGINES save 75 per cent in  
space, weight, friction, and parts, with great economy in steam.  
Adapted to all uses. For circular address the  
HICKS ENGINE CO.,  
23 cowtf No. 88 Liberty street, N. Y.

**CLOCKS FOR TOWERS, OFFICES, ETC.,**  
also Glass Dials for illuminating. Address  
JOHN SHERRY, Oakland Works, Sag Harbor, N. Y. 713 cow\*]

**PLATINUM, IN ALL FORMS, FOR ALL**  
Purposes, wholesale and retail. H. M. RAYNOR, Importer,  
748 Broadway, New York. Scrap end Ore purchased. 26 cow5\*

**F. U. STOKES, MODEL MAKER, NO. 7 West**  
Fourth street, Cincinnati, Ohio. 44\*

**THE CELEBRATED "SCHENCK" WOOD-**  
worth Planers, with new and important improvements, are  
manufactured by the Schenck Machine Co., Matteawan,  
New York. T. J. B. SCHENCK, Treas. JOHN B. SCHENCK,  
Pres't. 1\*

**GUN MACHINERY FOR SALE CHEAP.**—  
Call on or address  
THE GREENE RIFLE WORKS, Worcester, Mass.,  
F. W. HOOD, Supt. 1\*]

**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 1/8ths 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 gen-  
erator 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 econ-  
omy 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 super-  
heated 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  
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 circum-  
stances, 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 height.  
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. 16\*

## 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 tons 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,** 1st] No. 72 Sudbury street, Boston, Mass.

## TOWER'S

**ALCOHOL PROCESS OF TANNING.** Patented Dec. 1865; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months.

It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better. Every one knows the preservative effect of alcohol upon all animal matter.

It is applicable either to limed or sweated skins or hides. From sweated skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market.

No complicated or expensive machinery is needed. Any tannery may be adapted to the use of this process, for less than one hundred dollars.

Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston

L. FREDERICK RICE, Agent.

**\$150 A-MONTH! NEW BUSINESS FOR AGENTS.** [19 13\*] H. B. SHAW, Alfred, Me.

## 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 &amp; CO.

**CINCINNATI, OHIO.** Patented and Manufacturers of all kinds of **PATENT WOOD-WORKING MACHINERY** of the latest and most approved description. Particularly designed for:  
Navy Yards, Ship Yards, Railroad, Car and Agricultural Shops, Mills, Etc.  
Sash, Blind and Door, Wheel, Fell and Spoke, Stave and Barrel, Shingle and Lath, Planing and Resawing.

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 ly

## R. BALL &amp; CO.

**SCHOOL STREET, WORCESTER, MASS.** Manufacturers of Woodworth's, Daniel'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\*

## LENOIR PATENT GAS ENGINES.—WITH-

out 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.

## GROVER &amp; 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. Wood-working 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,** Coxsackie, N. Y. 1 tf

**\$1500 PER YEAR,** paid by **SHAW & Clark,** Biddeford, Me., or Chicago, Ill. 19 13\*

## ATMOSPHERIC TRIP HAMMERS.

Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by **CHARLES MERRILL & SONS,** No. 556 Grand street, New York. They are very simple in construction, require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or sawing they are unequalled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x56 inches floor room. Send for circular giving full particulars. 1tf

## 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 tons 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\*

## IMPORTANT TO RAILROAD TRAVELERS.

**THE PORTABLE RAILWAY HEAD-REST OR POCKET-BERTH.** Patented July 4th, 1865. SUBSTANTIAL, SIMPLE, COMPACT. By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railroad Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made. Agents wanted in all the principal cities. Address **JOHN R. HOOLE,** Selling Agent, [19 13\*] No. 124 Nassau street, New York.

## ERICSSON CALORIC ENGINES OF GREAT-

LY 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 horsepower 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. 10 1y

## THE AMERICAN VISE—A WELL-CON-

structed 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\*

## INCORUSTATIONS 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\*

## AMERICAN EMERY.—GUARANTEED SU-

perior 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\*

## ROCKWOOD &amp; CO., PORTRAIT, LAND-

scape, and mechanical photographers, 339 Broadway, New York. This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 19 33

## PEQUOT MACHINE CO.,

MYSTIC RIVER, Conn., Manufacture the most Improved

**LOOMS**

FOR WEAVING TAPES, BINDINGS, WEBBING, RIBBONS, ELASTIC GOODS, AND ALL KINDS OF NARROW FABRICS.

Our Looms will run faster, do more work, are less liable to get out of order than other kinds, and are warranted superior to all others in every respect. Supplies of all kinds furnished for the same. 24 8\*

## FOR WOODWORTH PATENT PLANING

AND MATCHING MACHINES, Patent Siding and Resawing Machine, address **J. A. FAY & Co.,** Cincinnati, O. 3 1y

## "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 **HOLMES & KNEELAND,** Nos. 528, 530, and 532 Water street, near Jefferson. Refer to **SCIENTIFIC AMERICAN** Office. 1 tf

## 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

## 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\*

## FOR DANIELLS'S PLANING MACHINES,

Car Mortising, Boring Machines, Car Tenoning Machines, Car Planing and Beading Machines, etc., address **J. A. FAY & CO.,** Cincinnati, Ohio. 4 1y

## 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.

## 10,000 AGENTS WANTED, IN EVERY

TOWN, COUNTY, and STATE, to sell Toplit's

Patent Perpetual Lamp Wick. Needs no Trimming. Sample sent for 20c; two for 50c. State and County Rights for Sale.

**MURPHY & COLE,**

81 Newark Avenue, Jersey City, N. J. 3 tf]

## 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\*

## 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.

## VAN DE WATER CELEBRATED WATER

Wheel for sale at the Eagle Iron Works, Buffalo, N. Y. Send for Circulars. [26 8\*] **DUNBAR & HOWELL.**

## WE WILL CONTRACT

FOR THE MANUFACTURE OF ANY KIND OF MACHINERY requiring good workmanship. Punching Presses, Dies, and tools of all kinds. Have unusual facilities for doing this class of work promptly. **MOSES G. WILDER & CO.,** West Meriden, Conn. 16\*

## CAUTION.—THE PUBLIC ARE HEREBY

Informed that the Patent of Hewitt & Haly, bearing date May 8th, 1866, is subordinate to the Patent covering "Ashcroft's Low Water Detector," all infringements will be prosecuted to the extent of the law. **JOHN ASHCROFT,** 50 John street, New York. 4 4]

## OLMSTEAD'S PATENT FRICTION CLUTCH

**PULLEY** is adapted to any machine that runs with a belt, and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line.

Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently or to speed up instantly.

Parties wanting these Pulleys are invited to correspond with **WM. M. BETTS,** Sole Proprietor, Stamford Machine and Tool Works, Stamford, Conn. 19 16

## THE BEST FORGING 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. 4 tf

## TO RAILROAD AND TELEGRAPH COM-

PANIES.—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.

## BROUGHTON'S OILERS.—THE DOUBLE

Bottom, The Seamless, The Engineers', The Double-acting, and the Transparent Top. Sold at first-class Hardware stores. 4 15] **BROUGHTON & MOORE,** Manufacturers, New York.

## BULLARD &amp; 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-collaring Boxes, guaranteed to run six months without re-oiling, and save 80 per cent of oil. By making a specialty of shafting, we are able to furnish very superior work at reasonable rates. Heavy work built to order. 2 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.

## ANDREWS'S PATENT PUMPS, ENGINES,

etc.—CENTRIFUGAL PUMPS, from 30 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 1/2 to 6 tons. 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]

## OXY-HYDROGEN STEREOPTICONS,

OXY-CALCIUM STEREOPTICONS, DISSOLVING 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,**

723 Chestnut street, Philadelphia. 21 52\*

## 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,**

No. 3 Bowling Green, N. Y. 26 tf

## ENGINEERING SCHOOL, FRANKLIN, N. Y.,

has full equipment, and offers thorough instruction. Special advantage—the small cost of living. For Circulars address **21 12\* G. W. JONES, A. M.**

## WHEELER &amp; WILSON, 625 BROADWAY,

N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1tf

## AMERICAN PEAT COMPANY.—THIS COM-

pany, 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, 42 1/2 Kilby st., Boston.

## M. BAILEY &amp; CO.,

PROVISION BROKERS, No. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 18\*

## STEAM ENGINES WITH LINK MOTION,

Variable Automatic Cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, etc. Address **7 26\*] M. & T. SAULT,** New Haven, Conn.

## 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

## 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, Slatteryville, Ill. R. I. 20 26\*

## REYNOLDS'S TURBINE WATER WHEELS!

**REYNOLDS'S PATENT SWEEPS THE FIELD!**

New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Works; Compact for Shipment; Great Water Saver.

THE ONLY WHEEL THAT EXCELS OVERSHOTS!

Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. **GEORGE TALCOTT,**

Late **TALCOTT & UNDERHILL,**

No. 96 Liberty street, N. Y. 21 13\*]

## TO WRENCH MAKERS.—FOR SALE UPON

Reasonable Terms, a valuable patent on a Pipe-Wrench. Address, [26 1tf] **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 1/4 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,**

P. O. Box 1,057, Boston, Mass. 26 18\*]

## MESSEURS LES INVENTEURS—AVIS

Important. Les inventeurs non familiers avec la langue anglaise, et qui préféreraient nous communiquer leurs inventions en Français peuvent nous adresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront regues en confiance.

**MUNN & CO.,**

Scientific American Office, No. 37 Park Row, New York.

**Improved Oiler for Machinery.**

The overflow of oil in the common can, and the difficulty of keeping the outside clean and free from grease, make it a source of much annoyance when used on nice machinery, or about sewing machines, and machinery for weaving such fabrics as silk and other delicate goods. In using the oiler with the greatest care, a minute drop of oil will be left at the top of the tube and will find its way to the outside of the can. The illustration represents an improvement intended to obviate these difficulties.

A represents an oiler, which may be of any convenient form and proper material. A small pipe projects from the delivery tube down into the oil, and is furnished with one or two branches extending upward to a cup, B, surrounding the tube, or to the top of the screw flange, C, which is made concave. The lower end is provided with a globe valve, D, which contains a hollow sphere, through which a pipe runs and debouches at the bottom of the weight, E. When the can is erect these pipes are all in line, admitting the air through the apertures in the tube to the oil, and allowing whatever oil is left, after using the can, to find its way back to the interior. When the oiler is canted for use, the connection between the oil in the interior and the orifices at the side of the tube is broken (see dotted lines), so that no oil can pass out except through the top of the tube. At the bottom is a ring, F, of lead, or some heavy metal, which gives security to the base, and the bars, G, which extend across it from side to side, prevent the spring of the bottom from setting. The valve is put together with a screw thread, and the parts can be readily removed for cleaning. This device can be applied to any ordinary oiler at a small expense.

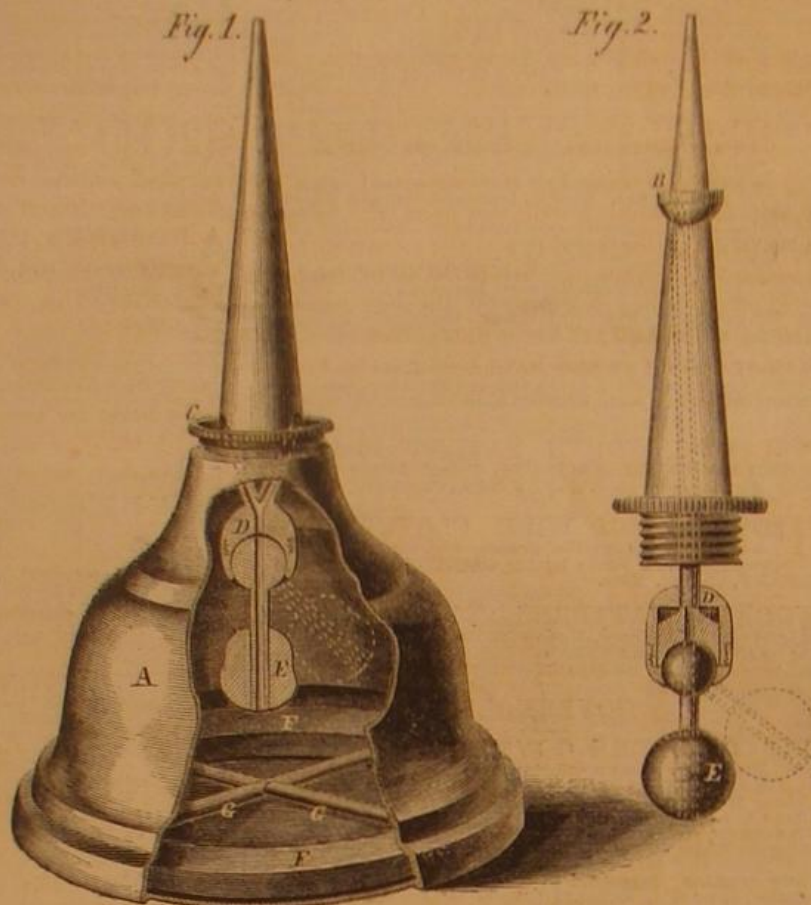
Patented April 24, 1866. For further information address J. M. Thompson, 2d, or G. L. Holt, Box 1,058, Springfield, Mass.

**Improved Gas-pipe Tongs.**

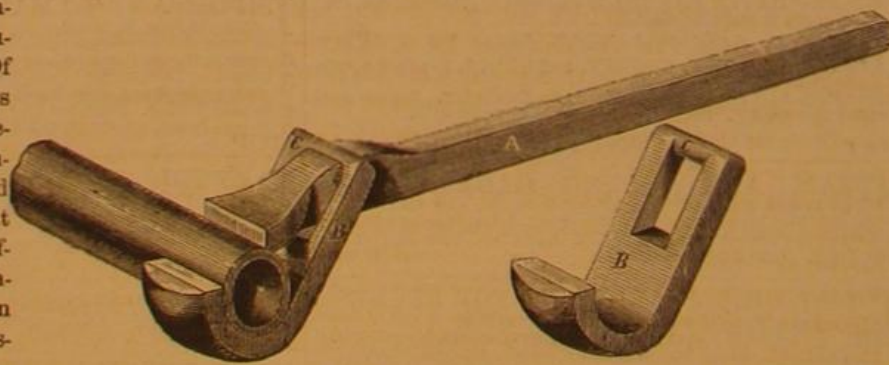
Pipe tongs are now universally used, not only for the work of the gas-fitter, but for many purposes in the shop and the manufactory, and about oil wells. For almost every differing size of pipe, or shaft, another and separate instrument must be provided. Of course, the common tongs are costly. The improvement represented in the engraving is designed to afford a cheaper tool, and one that can be easily adjusted to different sizes of pipe. Its construction and operation can be plainly seen by the illustration.

A is the handle, or lever, with edge to gripe the pipe, and having a jaw, B, entirely disconnected, but resting in a recess in the lever, by the spade-handle joint, C. The location of the notch in the lever and the length of the hook jaw are such that when the pipe is engaged the edge of the lever touches the pipe at a point insuring a hold and preventing slipping. The ease with which the hook, B, may be disengaged from the lever, A, and other sizes substituted, and the facility with which alterations of size and form may be made, show peculiar advantages for this device.

Patented May 1, 1866. Those desirous of purchasing the tongs or right to manufacture, will please address John H. Cooper, People's Works, corner Front street and Girard avenue, Philadelphia, Pa.

**HOLT & THOMPSON'S IMPROVED OILER**

in a bath prepared in the ordinary way, and containing a full amount of silver (say forty grains to the ounce) and about four drops of nitric acid to each pint of solution. The plate should stay in the bath not less than five minutes. After its removal, wash the plate moderately well, for about half a minute, under a gentle stream of common water, and finally with a little distilled water. The plate may now be placed to dry spontaneously or by gentle heat. No preservative being required, one of the difficulties and uncertainties of dry plate photography is left out. The time of exposure in the camera may be very readily determined by one or two experiments.

**BANNISTER'S GAS-PIPE TONGS.**

It should not exceed double that of wet plates. Before developing, it is advisable to run a little varnish round the edges of the plate with a camel-hair pencil, or the film is apt to get loose. Slightly wash the dry plate, and pour over it the ordinary iron solution, letting it well penetrate the film. Pour off into the measure, and add two or three drops of a 30-grain solution of silver. Proceed again with the development, and the picture will make its appearance almost as rapidly as a wet plate. Viewing it by transmitted light, the details should all be well out ere washing off and proceeding to intensify with pyrogallie acid; or, should it be found that the plate has been rather under-exposed, the first development may be continued by the gelatino-iron solution, after

**Resin in Collodion.**

BY WM. ENGLAND.

In as few words as possible I will give you the mode of working which, in my hands, has produced the best and most certain results. Prepare the collodion by adding to ordinary bromo-iodized collodion two grains of bromide of cadmium and two grains and a half of common resin to each ounce of collodion. It will readily dissolve by shaking the bottle a few times. Allow this to stand an hour or two, and, when required, coat the plate and sensitize

as much detail as possible has been brought out by the ordinary iron. In fact this mode of development enables one to give very short exposures. Ten seconds I have found quite sufficient for a portrait in a glass room with moderate light. The fixing may be done with either cyanide or hypo, in the usual way.

Now a word or two on the subject of the bath. See that it is in good condition by trying a wet plate before preparing the dry, or failure will be the result. After having passed two or three dozen plates through the bath, it may show signs of fogging; therefore, after each batch of plates is prepared, a few drops of ammonia, or solution of carbonate of soda, and a few drops of a solution of cyanide of potassium, should be added, and the bath placed in the sun till wanted again, when, after filtering and adding a few drops of nitric acid (just sufficient to make it slightly acid), it will again be found to work perfectly. This method may be adopted from time to time as may be found necessary. Where a large number of plates is required, two baths may be used, so as to have one or the other continually exposed to the sun. This "doctoring" of the bath may be thought very troublesome, but in practice I have not found it so. Probably Mr. Cooper, who has already worked with resins, or some other experimentalist, may discover some substance which may give the necessary qualities to the collodion without exercising a baneful effect upon the bath. The whole of the resins I have tried—such as amber in chloroform, mastic, copal, Canada balsam, guaiacum, etc., have all the same effect, both on the bath and the results obtained. No doubt they act mechanically in breaking up the structure of the film and giving it the necessary qualities to receive the developer.—*Photographic News.*

**Patents in Canada.**

A few days since we wrote to Canada for information in regard to the proposed change in the Provincial patent laws, and have received the following from Mr. Taché, Superintendent of the Bureau of Agriculture, at Ottawa:—

"I am in receipt of your letter, and all I can say in reply is, that the Government have officially intimated their intention, during the debates of the Legislative Assembly, not to alter the existing patent law on account of Confederation being so close, although they have made up their mind that alterations must be made in the said law as soon as possible; the reason for further delay obviously being that the Sister Provinces are to have their voice in such alteration."

**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.....35 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 & CO.

# Scientific American.

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

Vol. XV.—No. 6.  
[NEW SERIES.]

NEW YORK, AUGUST 4, 1866.

\$3 per Annum,  
[IN ADVANCE.]

## Improved Shingle Machine.

This machine is intended to make smooth and perfect shingles of a different form from those generally used. It is well known that common rough shingles do not last so long as those having smooth surfaces, and this is readily accounted for by the facility with which the latter shed moisture.

The shingle made by this machine is of uniform thickness at the exposed end or tail, but tapered, of course, at the other end, so as to permit one to overlap the other. The general arrangement is well

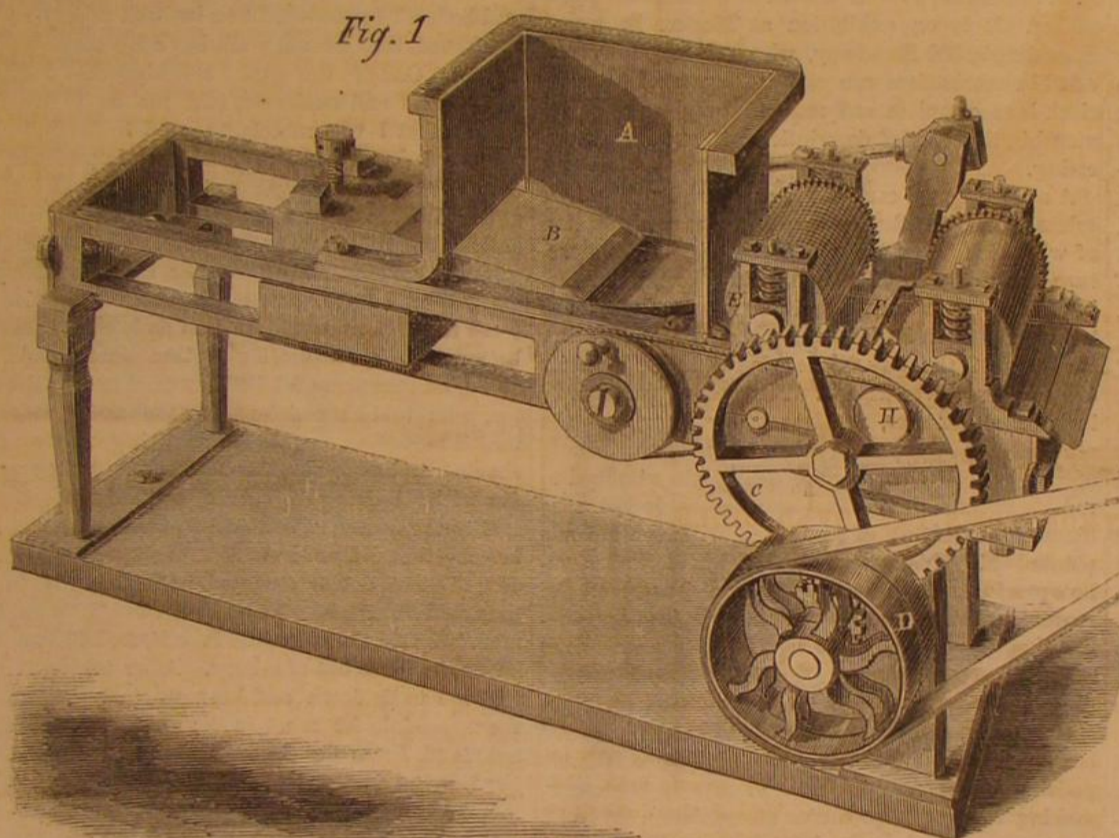
commerce, speedily wear them out, so that some of them are always out of repair.

## How Burglars Operate on Safes.

A month or two ago we remarked that the exploits of the London burglars upon the premises of Mr. Walker, the jeweler, and the subsequent trial between Mr. Walker and Messrs. Milner, have led to great efforts being put forth by the safe makers to increase the security of their wares. Since that time as many as forty patents have been got out by safe-

ception of the piece—about one inch by half-an-inch—cut out of the outside band—scarcely a mark was observable on the exterior. In respect of the new safe which has just been sent from Wolverhampton, the object of the maker seems to have been to construct one without any additional mechanism to the ordinary safe, so that it shall be impossible for a burglar to insert a wedge around any portion of the door at all. By making a safe wedge-proof, it is also crow-bar proof, as the latter instrument is of no value without a bite and a fulcrum. Mr. Price's doors being case-hardened, he had only to carry the principle a little further and case-harden the frame into which the door fits. This is what he now does, and, in addition, forms the inner frame of bars 5 inches

Fig. 1



CONNETT'S SHINGLE MACHINE.

shown in the engraving. The bolt is placed in the hopper, A, so to speak, and the knife, B, forced through it by the action of gearing, C, driven by a pulley, D. This severs a straight slab from the bolt, which is carried on through the machine by the feed roller, E, to the center of the machine, where it meets a knife, F. This knife has a vertical motion given it by a cam, G, below the frame, so that it shaves a thin end on the shingle, and is then elevated quickly, allowing the piece to pass on. Previously, or during the passage of the material, the edges have been planed by knives affixed to the side of the frame. One of these is fixed and the other is operated by a screw through pulleys, H, so as to adjust it for any width.

These are the principal details. The machine is strong and substantial, and is calculated to produce a very superior class of work.

A patent is now pending through the Scientific American Patent Agency by A. M. Connett, of Madison, Ind., whom address for further information.

## Tunnel Under Chicago River.

The Common Council of Chicago has ordered the tunneling of the south branch of the river in that city at the Washington-street crossing. The tunnel is calculated to relieve three bridges and enable 10,000 vehicles and 50,000 persons, who now cross those bridges, to pass and repass the river without obstruction or loss of time. The enormous amount of travel over the bridges and the necessity of continually opening and closing them to accommodate

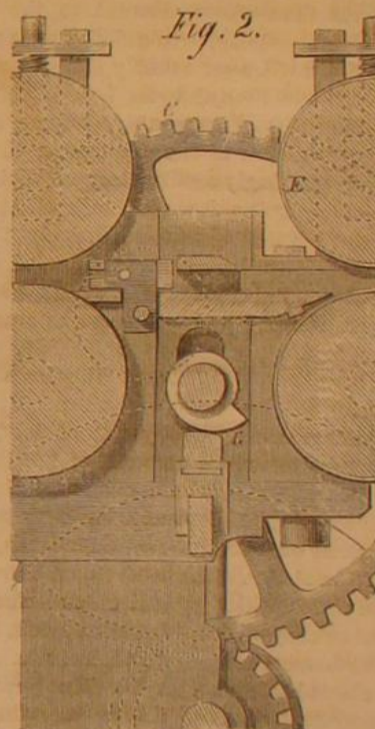
makers, all with the view to increase the ability of the safes to resist the attacks of burglars. We have just seen a safe that has been constructed upon one of these patents. It was produced by a Wolverhampton firm—that of Mr. George Price, of the Cleveland Works—and by the time this appears in print, it will be on the premises of the purchaser, in London. It has been bought by Mr. Johnson, jeweler, of Threadneedle street, who was robbed of property worth about £4,000, in 1864, by a party of burglars known as "Scotty's" gang. The ability with which the burglars opened the safe in the stamp office at Manchester, and stole property worth £7,000 lately, has shown that the thieves have improved in their method of attack since the robbery at Mr. Walker's. In the opening of Mr. Walker's safe, no drill was used, but the outside band was forced partly away from the left-hand side of the safe, sufficiently to allow the point of the crow-bar to enter and bite under the door-plate. With the stamp-office safe, however, the burglars first drilled a piece out of the point of the outside band, at the extreme left-hand corner, over the door. They then cut the piece so drilled square, which exposed the back of the door-plate, behind which they drove their first wedge, or chisel. Next they forced another wedge a few inches from the first, but against the face of the outside band, which brought away the door-plate sufficiently to allow the crow-bar to be got at the back of the door, as with Walker's safe, and with one wrench the door was opened. We examined the safe after the robbery, and, with the ex-

wide by 1 inch thick, which, instead of being dove-tailed at the corners, as is usual in all safes, he bends the bars. In order to make the four pieces into one continuous ring or band, he dove-tails the straight pieces into the bent pieces, and so obtains the greatest strength such a ring or band of iron is capable of giving. This case-hardened continuous ring or band is put inside the body plates—not outside, as in the safe opened at Walker's and the Stamp Office. As a further protection, if thought to be necessary, the inventor welds another bar of iron 5 inches by  $\frac{3}{4}$  inch, and shrinks on to the outside at the back and front of the safe. The construction of this safe is decidedly simple, and it seems to us to offer a very great amount of resistance to the operation of the burglar's implements which have recently proved so destructive of security.—*Ironmonger.*

## THE TELEGRAPH.

After four trials, involving an expense of not less than \$3,000,000, the great work of successfully laying a submarine telegraph between Europe and America is accomplished, and on the 29th ult. the New York dailies were, by its means, furnished with news from central Europe only thirty hours old. The cable of 1858 indisputably worked, but in an unsatisfactory manner and only for a very short time. There is hope that this present line will prove to be a permanent success. If perseverance and determination ever deserved success it is in this instance. Its success will be a cause of rejoicing among all enlightened and intelligent people.

Fig. 2.



## OUR SPECIAL CORRESPONDENCE.

*Finding the summit—Comparative profits of grain and grass growing—Reaping machines not profitable—Great value of mowing machines to women.*

ORE HILL, SALISBURY, CONN.,  
July 18, 1866.

Desiring to spend a few of the hot weeks among the mountains, and not knowing where to go, I opened my school atlas to examine the geography of the Berkshire hills. Being possessed of the rare knowledge that water runs down hill, I traced up the water courses to their sources, and found that, from a spot near where the corners of Connecticut and Massachusetts meet the eastern line of New York, the small streams radiate in all directions. I concluded that that must be the highest land in the region. Judging this to be about a hundred miles from New York, I called at the Harlem Railroad office for a ticket that distance up the road by express train, and was furnished one to Millerton, ninety-six miles. After enduring for four hours the intolerable dust of an American railroad, I arrived at Millerton, and was told by Mr. Sherman, of the Millerton Hotel, that the summit was four miles above, and that it is 1,135 feet above the level of the sea.

In the course of conversation at supper, I remarked that Daniel Webster once stated in an agricultural address, that in all countries and in all times, as a general rule, grazing districts had been more prosperous than those devoted to the raising of grain. The next day, while riding with an old resident of the town, a remarkably shrewd and keen observer, he told me that he had traveled a good deal through Dutchess county, buying stock, and that the condition of the farmers in the different towns was strikingly confirmatory of Webster's general law. Beginning down the railroad at Rawlings, which was devoted almost exclusively to grazing, the farmers owned their lands clear of debt, they owned the capital stock of their bank, \$300,000, and Michigan railroad and other stocks amounting in the aggregate perhaps to \$1,000,000. The next town above Rawlings is Dover; this has a little good grain land, though it is devoted mostly to grass. The farmers are generally out of debt, and hold stocks probably to the amount of \$500,000. Next comes Amenia, which has a good deal of grain land, though its principal product is the milk of its cows. The farmers of this town own their lands, and about \$250,000 in stocks. The next town above is North East, in which Millerton is situated. The land here is about equally divided between grain and grass, and the farmers about own their farms. The next town above is Copake, an excellent grain-growing tract, and the farmers of this town are in debt considerably more than is due to them. Hillsdale, above, is in about the same condition. All these statements apply to the condition of things before the war; since the war commenced the farmers generally have improved their condition, and Copake and Hillsdale have been further benefited by the introduction of sheep-breeding.

I have had the good luck to get into the house of Mr. Daniel Cook, which is situated two miles east from Millerton, a little over the Connecticut line, and just on the summit of a gap in the ridge which divides the valley of the Housatonic from that in which the Harlem Railroad is laid. He has a large, fine farm, and a nice house shaded with magnificent maples, and he belongs to that best portion of New England farmers—the descendants of the old Puritans: these men—industrious, provident, intelligent, conscientious, and obliging—are, in my opinion, the best class of people that are to be found on the face of the earth. As I sit on the piazza writing, I hear the clatter of mowing machines in different directions, and I suppose the same sound is now to be heard across the broad land, from Maine to Nebraska. The mowing machine seems to be universally regarded among farmers as the most valuable invention that has ever been made. Considering that hay is our largest crop, that its harvest comes in the hottest season of the year, and that a man with a machine will cut from ten to twelve acres, while, with a scythe, he could mow only one or two acres, the value of the invention can hardly be over-estimated. I find too, that here, as in Pennsylvania, it is appreciated quite as highly by the women as by the men, it shortens so much the period of haying, and the con-

sequent extra labor for providing for large gangs of men. I am surprised, though, to learn that the reaping machine is considered worthless. It takes so many men to operate it that its use in this region is not profitable. Mr. Cook says that he would not give fifty cents for the best one that ever was made, and though his fields of rye are broad, I see they are being cut to-day by the cradle.

Mr. Cook's farm stretches to the north up the slopes of Taconic mountain, which has given its own appellation to that geological formation, the discoveries in which have made the name of Dr. Emmons immortal; and one fourth of a mile east of this house is the great ore bed from which the famous Salisbury charcoal iron is made. In my next I purpose to give a full description of the manner in which the ore is mined and the iron manufactured. G. B.

## A FINE TOWER CLOCK.

The total destruction of the clock in Dr. Tyng's church, Stuyvesant Square, was one among the serious losses by that disastrous fire. The new edifice, however, is to be provided with another, surpassing its predecessor in elegance of finish, simplicity of construction, and certainty of operation. It was built by A. S. Hotchkiss, so well known as a successful clock-maker. It is on exhibition at Messrs. Browne & Spaulding's, 592 Broadway, where all who are interested in mechanism can call and examine it. The clock is so complete and successful a piece of workmanship that a brief description will not be uninteresting.

A solid frame of cast iron, supported by four iron columns, sustains the frame and works, every portion of which is finely finished. The height of the structure is seven feet. The time main-wheel, three feet in diameter, revolves once in 12 hours. It has the hours painted on its face, and has a pointer denoting the hour of the day. The "snail" is fixed on its arbor and revolves with it. The second wheel is 27 inches in diameter, revolves every hour, has the minutes on its face, and a pointer denotes the minute of the hour. It also has the lifting pin attached to unlock the striking. The "scape wheel is 8½ inches diameter, revolving in 3 minutes, with the seconds pointed off. This arrangement of wheels and numbers precludes the necessity of any dial work on the movement. The "scape wheel has 30 pins of a peculiar shape, designed by Mr. Hotchkiss to prevent the oil being attracted on to the wheel and leaving the pins dry—a source of great annoyance in former pin escapements. The pallets are of the finest agate, and both pins and pallets have the highest attainable polish. The pendulum will vibrate in 3 seconds, making its length to center of oscillation 29 feet 6 inches, or whole length about 31 feet. The weight of the ball will be about 300 lbs. Mr. Hotchkiss has invented a new plan of compensation that has the approval of some of our most scientific men, but as it is so far untried, it may not be well to describe it.

The strike side has two wheels the same size of the time, the third arbor having a short arm and pin to do the locking, and runs through the frame with four fans attached outside. The main wheel has 32 pins with finely-polished steel rollers. For lifting the hammer, three pins are placed in the second wheel, and a pawl that drops by its own weight on the frame, allows the train to move freely forward, but instantly checks a retrograde movement while winding. The second wheel has also near its center three gathering pins. A lever from the lifting pin frees the rack, allowing its arm to drop against the snail; it also unlocks and detains the train until the proper time for striking. Another lever catches the rack by means of an inside ratchet as each gathering pin leaves it, and holds it in position to receive the next, and so on until the end, when it drops into a slot and locks the train. The barrels are 18 inches in diameter, with spiral grooves for wire rope. One maintaining power is self-acting and adjustable to any required strength. The wheels are composition, or gun metal, the pinions solid steel, and the teeth of all are rounded at the bottom to secure the greatest strength. It is intended to run seven dials—three in each tower and one inside the church.

The nicety of fit and simplicity of parts are such that, although in ordinary clocks of this size a weight of 700 pounds is required for power, the time movements are to be driven by a weight of only 150

pounds, and the striking machinery by one of 150 pounds. The weight of the clock is 2,700 pounds and its cost \$5,000.

## A Poisonous Spider.

A correspondent of one of our exchanges thus describes the effect of a spider bite:—

"The night after the second Bull Run battle, the company to which I was attached encamped at Centerville Heights. The boys were short for blankets, having dropped many of them in their late forced marches. My "chum" and myself had one between us, with which we covered ourselves as we lay upon the bare ground. Soon after lying down I felt something like a bee sting upon my knee. On striking a match I found that I had been bitten by a large gray spider. I immediately took from my haversack a slice of raw pork, and bound it upon the bitten part, and again laid down. But I was soon in such pain that it was impossible to sleep, or even to lie still. The pain, which was at first confined to my knee, spread over my body and seemed to be centering in the pit of my stomach. I never knew before what pain was. In my distress, I started off to find the surgeon; but from the irregular manner in which we were encamped this was no easy job, and before I succeeded, I was in such misery and so weakened, that I could walk but a few steps without falling. One of the guard thinking that I feigned my distress and weakness, told me so to my face, adding that I was merely "scared to death." In a passion, I attempted to punish his impudence, but my anger did not rally my strength, for as I made at him I fell, and he escaped. Dr. Merrow, who examined me, said it was a bad case. He immediately gave me some medicine to take, and something to apply to my knee, and left me with directions to come to his tent again in half an hour if I was no better. At the expiration of that time I could not stand, and Sergeant Vickery carried me to the doctor, who told his assistant as soon as he saw me, that it was of no use to do anything further, as I should die before morning. Unwilling to see me die without doing any thing more, the assistant said to the doctor, "You know what we gave him before—that did not hurt him, shall we try another dose?" The doctor assented. On giving it to me they said "there is poison enough to kill seven well men." I told them I would take it, for I did not care how soon I was out of misery. After taking it they told me to lie down and keep quiet, as that was all they could do for me. In the morning, as I could not stand, I was put in an ambulance and sent to the hospital at Washington, where I remained two months before I was able to rejoin my regiment, and was in the train but a short distance from General Kearney when he was killed. Even to the present day I have not fully recovered, as whenever I take cold something of the horrible sufferings which I endured from that venomous bite returns upon me."

## Boots and Shoes.

The value of boots and shoes manufactured in the United States, in 1865, at wholesale, amounted to \$95,500,000, and in 1818 to not as many thousands. It was about this time that Rufus Chapin, of Milford, Mass., conceived the idea that boots and shoes could be made with pegs, and be as durable as if they were sewed. Acting on the idea, Mr. Chapin at once commenced the manufacture of pegged boots, splitting the pegs by hand from strips of wood, sawed by his direction into different lengths. This was the first introduction of pegged boots into this or any other country. He continued to manufacture pegged work successfully until his death in 1839; and this branch of manufacture has grown so rapidly that it now stands third on the list of manufactured articles in the United States. Mr. Chapin had five sons, who, from boyhood up to the present time, have continued in the business.

ALL the manufacturing establishments at Columbus, Ga., burnt during the war, are being rapidly rebuilt. A heavy New York firm has recently completed a rolling mill, which will be one of the first establishments in the whole country of that kind. The city bears but few traces of the ravages and devastations of the war.

## THE MANUFACTURE OF HAIRCLOTH.

Until within a recent period the haircloth, so extensively used in upholstering, was brought from foreign countries, mainly from Germany. The manufacture has, however, become a noticeable element in our mechanical progress. Haircloth of superior quality is now manufactured in this country. There are two general uses to which it is applied—one for ornament, or outside exposure, and the other for utility, merely. For the stiffening of fabrics, in which it usurps the place of the old-fashioned, unyielding buckram, known so well to the last generation as a means of giving the vertical rigidity to coat collars, demanded by the fashion of the day, it is even now extensively employed. In this case, where the fabric itself is concealed, it does not matter what its color may be, and no preparatory means are used to give a particular color to the hair.

For upholstering purposes, however, the fashion of the day demands a brilliant black. We can well remember the time when sofas and chairs were covered with a parti-colored fabric, composed of black and yellowish white hairs, disposed sometimes to form a regular pattern, but often used indiscriminately, making an unequal mixture of tints. Latterly, however, the demand has been for a uniform tint of brilliant black.

The wool or warp of hair cloth is of linen, cotton, or worsted. Most of that in general use is of cotton. Silk has been used to give additional luster and strength, and linen was substituted for silk for the same reason; but the looms for weaving are now constructed so that the upper surface, or "right side," contains four-fifths of the hair, giving the necessary luster and avoiding the requisite of a brilliant warp.

The hair used is horsehair, and is obtained from Tartary, the Ukraine, or Buenos Ayres, South America. Black being the favorite color, the manes and tails of the Ukraine horses are preferred, although the hair of a lighter shade can be dyed to a brilliant black. Apart, however, from the extra trouble and expense, dyed hair does not hold its brilliancy so well as that of a natural color, and is apt to grow "rusty." The width of the cloth is governed by the length of the hairs. It is rare, indeed, when these can be found measuring forty-two inches, generally far less. The wider the cloth the more valuable the fabric.

The hair, as imported, is assorted in bunches of nearly uniform color and length, and then further assorted and arranged by hackling. The hairs, being thus separated as to length, and divided as to color, are fed into the loom by hand. This has been heretofore the uniform practice, but the weaving has been improved by substituting mechanical devices for feeding the hairs. In Pawtucket, R. I., and perhaps in other places, a device for supplying the looms has been in use for several years. The result is far preferable to the old-fashioned method, and adds much to the capacity of the looms and the quality of the fabric.

The shorter hairs, which are unfit for weaving into cloth, are used for making horsehair mittens for rubbing the surface of the body, or are twisted into ropes, which, after being steeped in water, are baked in an oven, the heat of which fastens the twist of the hair and gives it that springy elasticity which makes it so popular as a stuffing for chair seats, sofas, and beds.

## Heavy Forgings.

The most interesting and one of the most important problems in the production of heavy masses of wrought iron is that of the manufacture of large naval guns. Steel appears to be quite unsuited to the requirements of large-bore ordnance, and cast iron, despite the American practice, is a material upon which no one in this country would, we think, like to venture. As for wrought iron, it has a greater dynamic resistance than steel, that is, what it wants in tensile strength it makes up in extensibility. It may require a steel inner tube, but rather to prevent the percussive action of the powder gases upon the wrought iron than as a direct provision against bursting.

There are three modes of working by which we may expect to make perfectly sound iron forgings

of any weight. The first is the forming of the pile from bars or slabs which have been surfaced by machine cutting, either planing, turning, boring, or drilling, as the form of the parts may require. This mode is followed by Mr. Ames in the manufacture of his guns, and it obviously affords a complete guarantee against flaws, etc., in the parts of which the pile is formed. The second point is to heat the pile wholly by gas, as in the regenerative furnace. In this furnace the iron may be almost melted, but never burnt, as it is exposed only to heat, and not to an oxidizing flame as in a common heating furnace. With clean surfaces to begin with, and a bath of intensely hot but non-corrosive gas, the iron may be made as plastic as the softest wax, and its perfect welding may be insured. This is attended with no loss or injury by burning, and for large masses and quantities of iron there can now no longer be any doubt that the gas furnace affords also the cheapest as well as the best mode of heating. The third point in forming large forgings is to subject them to sudden and powerful hydraulic pressure, as may now be done by the various hydraulic forging presses, one of which, as now fitting at Messrs. Platt Brothers', at Oldham, we not long since illustrated.

Experience has shown that the forcible pressing together of clean surfaces of wrought iron at a white heat insures perfect welding, and is, in fact, the next thing to founding in wrought iron. Wrought iron, when sufficiently carburized to be fusible, is commonly called "homogeneous metal," and in this form it appears to be wanting, too, in dynamic strength, although it is believed to be stronger in this respect than cast steel. Great pressure is of very great value in the case of steel ingots. Mr. Ramsbottom has greatly improved the quality of Bessemer ingots by squeezing them in his enormous "cogging machine," which we illustrated a few months ago (Vol. I, p. 42). Mr. Whitworth is, we believe, about to employ great pressure in the manufacture of cannon; and Messrs. Firth & Sons, of Sheffield, are also about pressing cast-steel shot. The advantages might not prove wholly of the same kind in the case of pressing wrought iron while hot, but it would secure perfect welding where, by the means pointed out, care had been taken to prevent the formation of scale.—*Engineering*.

## Granulation of Blast-furnace Slags.

For the past two years the granulation of blast-furnace slags has been successfully accomplished in France, the whole of the inconvenience usually arising from the accumulation of masses of vitreous matter being thus avoided. The slag is simply permitted to run into water instead of running upon the ground, as usual. The water used is the waste from cooling the tweers, etc. A suitable pit is formed to receive the water, and the molten slag is run through a gutter into it—of course, becoming finely divided and friable. The slag-sand is raised by an endless chain of buckets, and removed in carts, or otherwise. It is useful for making mortar and silicious bricks, as well as for agricultural and a variety of other purposes. The invention of the process is due to Mr. Minary, and may be seen in use at the works of the Franche-Comte Forges Company, in the department of Jura. The sands vary in color from dingy-gray to dark brown or black, and weigh about 1,200 kilogrammes the cubic inch.—*London Mining Journal*.

LOCUST STINGS.—The Greensburg (Pa.) *Argus* says that Wm. Kettering, of Hempfield township, was stung in the neck by a locust, a few days ago, while plowing, and was compelled to take to his bed, suffering great pain. Two other cases of stings by locusts are also said to have occurred in Pennsylvania, one of which proved fatal. If these instances are well authenticated, they should be a warning against handling the pests.

QUICK WORK.—On the 30th of June we forwarded to our agent, in Paris, the necessary papers for two French patents. The applications were immediately filed, and certificates of allowance were issued on the 13th of July. On the following 24th we received the certificates at our office. This is what we call doing business with dispatch.

## MISCELLANEOUS SUMMARY.

NEW CAR-WHEEL FACTORY.—Messrs. Davenport, Fairburn & Co., of Erie, Pa., have lately put in operation in that city, a large concern for the manufacture of car wheels and other railroad castings. The wheels are said to be very superior. The *Erie Daily Dispatch* says: "Human muscle and sledge hammers have no more effect upon these wheels than a drop of rain upon a granite rock. They have been put to the severest of tests, and so far it has been found impossible to break them by any ordinary method. And after the works were put in full motion, but one wheel in one hundred and twenty was condemned as imperfect."

MESSRS. A. T. STEWART, W. B. Astor, C. Vanderbilt, and H. B. Claffin, four of New York's leading wealthy men, will return and pay together on ten millions of private income, exclusive of the taxes on the large mercantile business of two of these gentlemen. The same parties for 1864 paid on not more than four millions. It is said that Stewart's income last year amounted to \$4,700,000. If Stewart lives long enough, and observes economy, there is a reasonable prospect that he may have a handsome property.

PETROLEUM FROM CANNEL COAL.—The *Mining Journal* says that there are four companies in New South Wales employed in extracting oil from the cannel coal found about seventy-four miles from Sydney. The coal yields from 40 to 150 gallons of oil to the ton, and it is estimated that it can be extracted, refined, and delivered in Sydney at a cost of about 1s. 8d. per gallon.

A GOOD OLD STOVE.—A correspondent writes that John Hamilton, of Clark county, Ind., has a stove made at Elizabeth Furnace, Va., in 1769. The date and name of furnace are yet quite plain on the stove, but rust has obliterated the maker's name, so that it cannot be made out. It has been in Mr. Hamilton's possession 35 years, and is yet a good stove.

LOUISVILLE, Ky., is reviving from the lethargy into which the war had plunged her, and her foundries number forty concerns, principally workers in iron, copper, and brass, giving employment to 1,700 hands, and employing a capital of \$2,500,000. The amount of coal consumed is 4,000,000 bushels per year.

A COTTON manufacturing company has been organized at Cuthbert, Ga., of which Mr. John Hardie, of Eufaula, Ala., is President. The factory is to be two stories high, with a width of 125 feet and a length of 300 feet; \$500,000 of stock has been subscribed and \$150,000 paid in.

SAWING OFF LEGS.—In a Berlin military hospital they perform some amputations with circular saws. A fine toothed saw running at a high velocity, would sever a limb instantly without making a ragged cut, but we presume the "flaps" are made first with the knife, as it could hardly be done with a saw.

CEMENT.—A correspondent suggests that a cement for mill stones, nearly as hard as stone, and one that dries quickly, can be made by mixing together, like mortar, lime, cottage cheese (which is known in Germany as *schmier kase*), and white sand, in proportions best determined by experiment.

THE assay of the gold from the rich mine of gold and silver discovered recently in Ulster County, New York, in the Shawangunk Mountain, which was made at the Philadelphia Mint, and certified to, proves the quartz as rich as that of Colorado.

DRAUGHTSMAN ON WOOD.—A good designer and draughtsman on wood—one capable of doing first-class mechanical work—may find constant employment at the office of this paper.

THIS is the season of rapid passages over the Atlantic. The *Scotia*, an English iron ship, made the voyage from Queenstown to this city in 8 days and 17 hours; the fastest trip on record.

SAFES IN THE PORTLAND FIRE.—We are assured by the manufacturers that all of the Herring safes which were exposed in the Portland fire, withstood the elements, and protected their contents.

A PARTRIDGE recently struck a telegraph wire near Forres, France, and had its head cut clean off.

BOATS float when ships founder.

## THE ADVANTAGE OF GOOD TOOLS.

Next to a practical knowledge of his business, the mechanic needs proper appliances and tools for its prosecution. It is an old saying, but hardly a correct one, that "a poor workman can use good tools, but only a good workman can perform a job with poor tools." The fact is that no workman can afford to use inferior and inefficient tools. "Make-shifts" can never usurp the place of proper tools. There may be cases when the mechanic is compelled to do a job without the appropriate instruments, but the result is seldom satisfactory, and if the desired end is attained, it is reached by an expenditure of muscle, time, and contrivance that robs the workman of half his gratification. He may exhibit his ingenuity and perseverance by persisting in the employment of inadequate means, but he does so at the expense of valuable time and energy, which could be more profitably used.

The rapid and constant improvement in tools and labor-saving contrivances, has greatly lightened the labors of the workman and increased the profits of the manufacturer. The mechanic who learned his trade twenty years ago, would be ashamed to do his work with the appliances which then were considered the best. He has been compelled, year by year, to forget the cunning of hand that alone made his crude tools efficient, and has had to learn the use of this improved tool and understand the advantages of that new process. But the lesson has carried its advantages with it. Possibly there is not so much necessity for the exercise of manual dexterity, but the proper adaptation of the means to the end, the stimulation of his ingenuity by recognizing the advantages of improvements already made, the pride in the results of his work—results gained by the use of tools perfectly adapted, and the rapidity and precision which are a consequence—more than repay him for the trouble of keeping up with the times.

Nor will these remarks apply to the mechanic alone. There is no branch of productive industry that has not felt the impetus of improved tools. The farmer who would now endeavor, with the implements he used fifteen years ago, to compete with his neighbor who selects from the agricultural ware house the best tools, will fail in his attempt, or succeed at the expense of unremitting toil and a life of slavery. In short, the enterprise and intelligence of the producer are shown more in his choice of means than in his industry and perseverance alone. Undoubtedly some of the devices for facilitating the processes of labor are any thing but improvements, but he who would reject all new inventions because some are failures is not wise. One has only to observe some one of the many new appliances now in use in any department of industry, and compare it with that which subserved a similar purpose a few years ago, to be convinced that in no branch of improvement has ingenuity been more usefully and beneficially employed than in the invention of new tools.

The apprentice at any business should be furnished with the best of tools and taught how to use them. It is poor economy to compel him to drudge with dull or worn-out tools, or those unsuited to his strength and inexperience. He becomes disheartened and disgusted with his business. Better he should ruin valuable tools than that he should be compelled to work with unsuitable implements. Let him be taught how to use and keep in order his tools and he will soon come to value them and feel an interest in his occupation. It is a wise economy to "use the best," as the nostrum venders advise. Whenever an improved implement comes into the market which will do the work required quicker, or better, or with a less expenditure of strength, it will pay to reject the one in use and procure that.

## Fleas.

Probably no annoyance from purely natural causes is so vexatious as that caused by fleas. Some districts are by them made almost unfit for human habitation—totally unfitted for human comfort. We have read one of Judge Haliburton's volumes of the Yankee Clockmaker in which "Sam Slick" stated that a common herb was a specific against their attacks, but through a strange perversity he neglected to say what it was. We believe it is the common pennyroyal. The oil of this herb, or, if

that is not readily obtainable, an infusion of the herb in water, will banish the pests. We hope some of our readers will give it a stronger test than circumstances have enabled us to do, and let the readers of the SCIENTIFIC AMERICAN know the result.

## INFLUENCE OF THE MECHANIC IN POLITICS.

Material force, embodied in vast aggregations of men, as armies or large fleets of warlike vessels, was once the instrument by which one nation sustained its influence or extended its power at the expense of others. This was the age of brute force. By it the Roman Empire ruled the known world. The Roman generals and statesmen were but the guiding and controlling agents of Rome's vast military power. Force, physical force, gave her the great preponderance of power which accords to her the fame of the strongest nation of antiquity. Her workers were either slaves in reality and by the force of law, or they were so by the force of circumstances. The soldier and not the artisan represented Rome, in an embodiment of force.

In the lapse of time all this was changed, and brute force gave way to its master, the intellect. Diplomacy undertook to do what arms before had accomplished, and until the present it is greatly relied upon to retain or extend the power of nations. But behind it is the principle of material force. "Might makes right" is the guide of diplomats as of unscrupulous generals.

A new era has introduced the mechanic and the inventor as an agent in the affairs of the nations. The nations rest their lease of power and designs of enlargement, either of territory or influence, directly upon the intelligent mechanic. This fact was exemplified in our late war, when the inventive talent and the readiness in contingencies of the *material* of our armies, enabled us to overcome natural obstacles and to repair hostile devastations with certainty and rapidity. Was a swollen stream to be bridged, an unfathomable and treacherous morass to be made passable, or an oversight to be remedied—the mechanical talent of our soldiers furnished the brains and sinew to do the work. As much was due in the general result to the skill and practical knowledge of our citizen soldiers, as to the combinations of generals or the pertinacity of leaders.

But we had another element of success, also due to the inventive talent and useful workmanship of our mechanics. Untiring industry and stimulated genius gave us the Rodman and Parrot gun and the Sharp and Spencer rifle. These were indeed "sickles of death"—patent reapers in his gory harvest. To their efficiency the result of more than one battle is due. Victory attended the labors of our intelligent mechanics. To them as much as to any human agency are we indebted to-day for a united and free country.

The present European war has, so far, given us another proof of the important position of the mechanic in the affairs of the governments. The Austrian army was as well drilled, disciplined, and supplied as that of her adversary. The cause for which either was fighting could not be counted upon as a means for infusing enthusiasm into the rank and file. Both had good leaders, and in all respects, save one, the forces were equal. That one was a superiority given by the inventor and the mechanic. They won the victories for Prussia. The irresistible needle gun, inferior to our best breech loaders, but vastly superior to the best muzzle loading piece, drove the Austrians from one position after another, until at the battle of Sadowa the Austrian army was dispersed in a rout, and the fate of the Austrian empire almost decided.

The mechanics of a country have a right, under such circumstances, to arrogate to themselves a proud position. They are, and will be, the arbiters of the nations. The governments in time of peace are strengthened and sustained by their labors, and in time of war defended by their skill. The genius of the mechanic unravels the Gordian knots which the pen of the diplomat fails to loosen. The Patent Office is as valuable as a means of preparation for war as West Point or the Naval School.

## An Unfortunate Inventor.

A deplorable incident occurred in the Bay of Valparaiso in May. A German, named Flach, having

constructed a torpedo-submarine boat, made several successful experiments in sinking and raising his boat in four fathoms water. He then took a party of friends on board, and with them proceeded some distance out in the harbor, and there sunk his boat, with himself and friends on board, in 30 fathoms. No anxiety was felt about the expedition for some time, Flach having stated that he could remain under water easily for the space of six or seven hours, but as the boat did not make its appearance about this time, considerable anxiety was created, and as evening advanced the anxiety increased. Unfortunately, Flach was so confident in the success of his experiments that he would not allow any buoy or rope to be attached to the boat, and thus no search could be made for them with any certainty of success. Every effort to find them was made by divers and otherwise, but no traces were found until five days afterward, when a diver discovered the boat, but at such a depth as to render it impossible for him to make a rope fast to it.

## CHEMICAL NOTES.

**ARTIFICIAL DIAMONDS.**—This old subject is again reviewed by M. Charcourtois, who believes that the diamond is formed in consequence of the decomposition of hydrocarbons, just as free sulphur results from the decomposition of hydro-sulphureted emanations.

He suggests the following process:—Submit a very slow current of marsh gas or a hydrocarbon vapor accompanied by the vapor of water to a very mild oxidizing action in a mass of sand containing putrescible matter, flour for example. The author admits that this process has been going on under our noses for years past, and thinks that diamond dust may be found in the black earth that surrounds the gas pipes where they leak under our streets.

**NEW SOLVENTS OF GOLD.**—M. Nickles shows that iodine under pressure, or even under the influence of light, will dissolve gold leaf. The sesquioxide and sesqui-bromide of iron also act as solvents.

**GUN-COTTON.**—Extensive experiments are in progress at Woolwich, England, with a view of examining fully into the extent of liability to change of gun-cotton when in storage or exposed to light and heat. The results hitherto arrived at, though they have shown that under severe conditions gun-cotton is liable to decompose, have not confirmed the conclusions arrived at by French chemists with regard to the great instability of this material. At Woolwich no instance of rapid decomposition has been noticed. It has been determined by experiments that gun-cotton can be preserved perfectly by immersing it in water or impregnating it with water sufficiently to render it unflammable, in which condition it is much safer than gunpowder.

**PRESERVATION OF LEMONS.**—A correspondent states that lemons may be preserved by the very simple process of varnishing them with a solution of shellac in spirit of wine. Fresh lemon juice is thus obtainable at all seasons of the year; and if the peel be required for flavoring, the skin of shellac may be easily removed by simply kneading the elastic lemon in the hands.

**ALUM IN IRON SAFES.**—A Vienna manufacturer makes fire-proof safes, in which a certain space is filled with powdered alum. When the heat reaches this, the water of crystallization is driven off, by which a great absorption of heat is produced and the temperature of the interior of the safe kept proportionately low. For ten years we have had an alum filled safe in our office. Ammonia alum is also used for the same purpose in England.

**PREPARATION OF BONES FOR MANURE.**—Illienkoff, a Russian chemist, gives the following process, which, it is said, has received the approbation of Liebig:—The author mixes say 1,000 parts of ground bones with 1,000 parts of wood ashes containing 10 per cent of carbonate of potash, and adds 600 parts of quicklime. This mixture he places in a tank or fosse with water sufficient to make the whole moist. In a short time the bony matter is completely disaggregated by the caustic potash, and the pasty mass formed is then taken from the tank, dried, mixed with an equal weight of mold, and is then ready to be distributed. We can easily believe that a preparation of this kind is a far better manure than superphosphate.

## TELEGRAPHIC CABLE.

A correspondent sends us a description of a submarine telegraphic cable, herewith illustrated, the invention of Prof. A. J. B. De Morat of Philadelphia, for which he has taken measures to secure patents in this country and in Europe. We give the ideas of our correspondent.

The causes of the failure of the cable of 1858 are yet wrapped in mystery. It is stated that at the depth of two miles the hydrostatic pressure of the water is 4,000 lbs. per square inch. The larger part of the present cable (see Fig. 4,) is composed of india-rubber or gutta-percha, jute, tar rope, or other similar material. Such a body must suffer compression under so great a weight, and will be extended in length. By calculation it is found that a cable one inch in diameter with a set of wires coiled about it four times in one foot, and reduced by the pressure a thirty-second of its diameter will increase in length between four and five hundred feet per mile. The center or conducting wires, being straight, could not yield sufficiently and retain their connection under such an extension. It would be difficult to ascertain if this was really the result, as upon bringing the cable to the surface the tension would be relaxed and the ends of the separated conductors might come together and the current be restored. A strict analysis of the cable would alone determine the fact.

Fig. 1, letter *a* represents an iron wire about 1-16th of an inch in diameter. Over this is wrapped tightly a very thin copper ribbon, in width  $1\frac{1}{2}$  times the diameter of *a*, as represented at *b*, then on this is wrapped, as tightly, a similar copper ribbon, being careful to cover the joints of the first, as at *c*. This is covered with a compact coating of india-rubber or other insulating material, as at *d*. Then wrap this with copper ribbon, in width  $1\frac{1}{2}$  times the diameter of *d*, as at *e*, Fig. 2, and this with another similar copper ribbon, covering the joints as before, as at *f*, and covering again with some insulating material, as at *g*. This process is continued until the desired number of conductors is obtained. In Fig. 3, *h*, we have an end view of a cable with six conductors, and an outside one to neutralize all earth currents.

Each of these double copper coils, *b c, e f*, etc., by the compact manner in which they are put on, become perfect copper cylinders, one within the other. Any compression of these cylinders only tends to lengthen the coil and never to break or sever connection. Being insulated from each other, each is an independent conductor and can be attached to its own instrument. The outer cylinder, by having a battery of any required strength attached, can neutralize all earth currents, and protect and equalize all the conductors within. In the experiments with these cables no inductive currents have been detected to interfere with perfect transmission of direct currents or telegrams. If there are any inductive currents, we may hazard the theory that they occur on the inner surface of each respective cylinder, and are thus rendered inoperative. Be this as it may, time will soon prove its fallacy or establish its correctness. Experiment has proved one fact, that the transmission of the electric fluid is perfect through each cylinder at the same time.

The advantages claimed are: First, It is lighter, and possesses remarkable strength for its weight. Second, Is more pliable. Third, Is more elastic, the conductors being the last to break. Fourth, Has many conductors, each being independent. Fifth, It can neutralize all earth currents. Sixth, Its power to transmit is not weakened by any inductive currents.

Out of thirty-five safes opened by one machinist, in Portland, since the fire, only five were found to have been really safe.



## Saws and Saw Filing.

MESSRS. EDITORS:—I saw some mention in a late number of your paper of a saw-filing hand-book or manual. Was it "Holly's Art of Saw Filing?" As yet I have never met with any other. Do professional saw filers or makers agree with him that the handsaw for cross-cutting purposes should be filed with the point of the file inclined toward the point of the saw, which is contrary to the common prac-

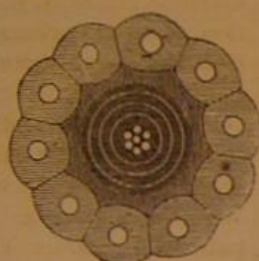
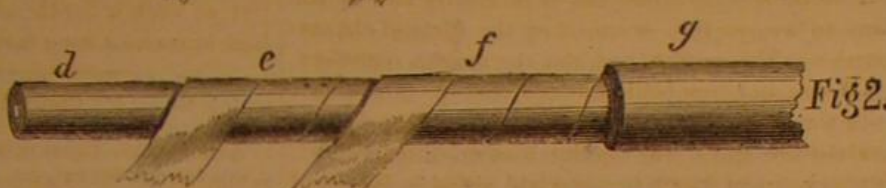
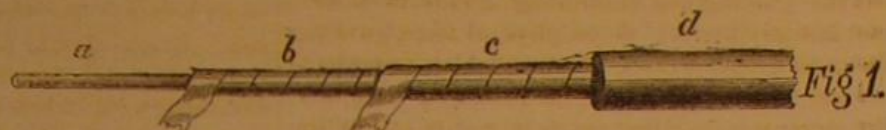


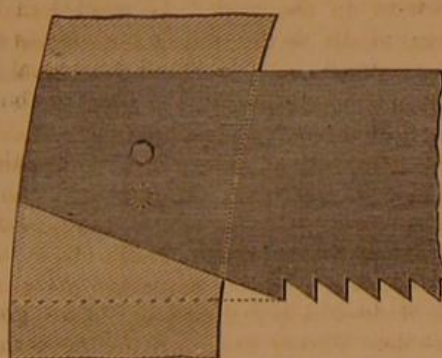
Fig. 4.



Fig. 3.

tice of carpenters in this part of the world? I have always supposed the file should, in its motions, meet the cutting edge of the tooth, in the manner the surface of the grindstone meets the edge of a chisel or plane iron.

I would like to suggest to saw makers that if the blades of billet or buck saws were made at the ends in shape like the accompanying outline, it would be



much easier to keep them in order. The hole should be punched about one-third the distance from the upper or back edge instead of in the middle of the blade.

I find great inconvenience after a saw has been worn in keeping the teeth straight on account of the uncut portions of the blade projecting below the line of the teeth. Sometimes, with a heated pair of blacksmith's tongs, I draw the temper from the ends of the blade and cut off the useless portion, or I file a cut on each side and break it off on the edge of a block of iron or hard wood.

R. E.  
Kansas City, Mo.

[We referred to Holly's work. On pages 20 and 21 he gives excellent reasons for filing toward the point. The value of his plan can be easily tested practically.—Eds.]

## Millstone Cement.

MESSRS. EDITORS:—I saw an inquiry in your paper of July 14, 1866, for a cement for millstones. Well, I can tell you what I use. I am an old miller and have been running flouring mills in this place for the last thirty years, and I never found any thing any better. Take burr block and powder it fine, and take equal parts of powdered burr block, alum and borax, melt and pour in the holes; this is next to the burr in hardness. But I prefer not to put any thing in at all; it does not do any good, it will not grind any thing, the holes do not hurt any thing, as they fill up with flour while grinding. I have had great experience in the milling business.

We are running three mills out of seven in this city, I built the first mill in this city some thirty years ago. I am a constant reader of your valuable paper and would not do without it.

A. HICK.

Springfield, Ill., July 16, 1866.

## Cement for Mill Stones.

MESSRS. EDITORS:—In return for much pleasant reading and useful information derived from your journal, I am happy to be able to reply to your inquiry for "a cement for mill stones." I used the following some twenty-five years since, in my steam mill on the Ohio River, viz: Take about equal parts of common alum, pulverized, and pieces of broken china, also pulverized; put the alum in an iron vessel over a hot fire until it becomes liquid, then stir in the powdered china, or so much of it as will still leave the combined mass semi-liquid, then, while yet hot, pour or plaster it into the cavity; it will soon cool and become as hard and immovable as any part of the mill stone.

E. A. T.

Huntingdon Valley, Pa., July 16, 1866.

## Keeping Circular Saws in Order.

MESSRS. EDITORS:—In Vol. XV., No. 4, page 51, of the SCIENTIFIC AMERICAN, an article written on this subject by Mr. A. S. Pettigrew, gives some valuable information, but it seems to be confined to a particular class of saws, viz., large saws for sawing lumber from the logs or square timber.

In an article written by myself, May 26th, and published in the SCIENTIFIC AMERICAN, page 360, I recommend running a circular saw nine thousand feet per minute at the rim. (In the article it reads nine hundred which was an error; it should have been nine thousand.) Mr. P. ridicules the idea, and makes an assertion of his own without giving any reason or rule. Now, I did not recommend, as he states, running the rim of a circular saw two miles a minute; I merely stated that a saw running nine thousand feet per minute was traveling nearly two miles per minute.

Mr. P. says that four hundred and fifty revolutions per minute for a sixty-inch saw is enough. Why does he not give his reasons? Mere assertions of one man is not proof. It is well known to the best millwrights that a sixty-inch saw will run with safety at six hundred, and they have been run at seven hundred and fifty. Thirty-six-inch shingle saws are very commonly run at twelve hundred revolutions per minute, and sometimes at fifteen hundred.

Mr. P. also asserts that a saw should be filed every one thousand feet of lumber sawed; and says that the five minutes occupied in filing is the most profitable five minutes of the hour. But suppose a saw is cutting three thousand feet of lumber per hour, then it would take him one-fourth part of the time to file his saw. I know of mills that saw, as an average, with one saw, from three to four thousand feet of good lumber every hour, and from four to six thousand feet without filing. I know of other mills that cannot saw one thousand feet without filing.

Of clean pine, hemlock, poplar, or other soft timber, from two to six thousand feet may be sawed profitably at one filing—other timber that has lain on river banks, sun-cracked, and rolled through the dirt and sand into the water, with the deep sun-cracks full of grit, or square timber that has been hauled through the mud, and every crack and crevice, and score hack dragged full of mud and sand, and often only one side of the teeth cutting (or rather one corner) just trimming off the side of the stick and striking fire as it goes—I think Mr. P. will agree with me that it will not be profitable to keep the points of the teeth of ordinary saws, where the teeth are made no thicker than the plate, spread to give them the required set in sawing such lumber without bending. Millions of feet of such timber are sawed annually. I think the wisest rule was given by King Solomon when he said: "If the iron be blunt, and he whet not the edge thereof, put to the more strength;" but wisdom is profitable to direct any man's judgment, and can guide him better than any fixed rule when to file his saw, without sawing just one thousand feet of lumber and then stopping to file.

Mr. P. also writes as though end motion made no difference with the running of a saw. I have seen saws do very good work with end motion, and when he takes exceptions to Mr. Ritchie's advice of

changing the lead of the saw, he virtually admits that end play is really detrimental, for it will be seen at once that if the rim of a saw is held in one position firmly in the guides, and the center allowed to move either way, it changes at once the range of the saw from a direct line. The very fact that saws are run and sawing lumber day after day, without end play and doing good work, ought to be sufficient proof that end play is useless.

I agree with Mr. P. that a saw will work better to spread the teeth for the set without bending them in clean lumber, but in gritty lumber I do not think it will pay. I trust this interchange of views will throw light on this important subject, and that you will continue the correspondence from practical men.

J. E. EMERSON.

Trenton, N. J., July 24, 1866.

#### Mills for Grinding Paints and Printers' Inks.

MESSRS. EDITORS:—We are job printers, and manufacture the greater portion of our colored inks, of which we use large quantities. The mill we use for grinding is the well-known Harris Paint Mill, only we have the hopper and runner made with a larger grinding surface than is required for paints. The entire mill is of iron. In grinding yellows, blues, carmines, lakes, and, in fact, every color except vermilion, we have no difficulty, but in grinding vermilion, the color changes to a dull brown. Now what is the cause of it? Is it the heat of the mill, the iron rubbing off, or does the iron oxidize? This is what we wish to know.

A marble mill would be the proper one for grinding printers' ink, and one made on the plan of the Harris Mill, with more grinding surface than is required for paints, would be the thing. Do you know of anything of the kind, and where they can be procured?

JAMES LUCAS & SON.

Baltimore, Md., July 11, 1866.

[Vermilion is a compound of mercury and sulphur. Being a sulphuret of mercury the sulphur would probably leave the mercury and combine with the iron of your mill. The heating of your mill, also, by friction, may impair the color of the vermilion. Sometimes when over-heated the color may be restored by a bath of warm water. Possibly the Harris Mill, of brass, driven at a low rate of speed, might grind your vermilion leaving its color intact. We can conceive no reason why marble could not be substituted for metal in the grinding surfaces of these mills, but we are not aware that any mills are made of this material. We would not recommend iron in any case for grinding delicate colors, as yellow, blue, or green. Composition or gun-metal is certainly preferable.—EDS.]

#### The Heating of Guns by Concussion.

MESSRS. EDITORS:—In confirmation of the theory of Professor Seely, respecting the heating of gun-barrels, I would like to make known, through the SCIENTIFIC AMERICAN, some facts in my own experience. One of the early forms of metallic cartridge had a central aperture, about one-tenth inch diameter in the base. The escape of powder and the entrance of moisture were prevented by a thin paper disk, saturated with melted beeswax and placed on the bottom, inside. Ignition of the powder was produced by fire from the percussion primer or cap passing through the paper.

Now for the facts I would call attention to. This thin waxed paper was never burned, nor was there even a scorching of the ragged edges around the rent made by the percussion primer.

The attentive reader will find the explanation given fully in Professor Seely's article in your journal of the 7th inst.

EDWARD MAYNARD.

Tarrytown, N. Y., July 7, 1866.

[The masses of iron which were burst by nitroglycerin in the experiments at Washington, reported in the SCIENTIFIC AMERICAN of July 21st, were said to have been very much heated. In this case the contact of the burning material with the iron was much shorter than is the case in the firing of a gun.—EDS.]

#### Cementing Tin and Glass.

MESSRS. EDITORS:—Is there any cement not affected by ether which will unite tin and glass? I

have tried several cements, but the ether seems to destroy them. I would prefer something like plaster of Paris—mushy—that would set and harden quickly.

T. E. L.

Cincinnati, Ohio.

#### Foreign Items.

A FEAT of almost unrivaled traveling was recently accomplished on the Great Northern Railway. On the occasion of the late fire at Newcastle, when the safety of the high-level bridge was endangered, a telegram was sent to London requiring the attendance of Mr. Harrison, the engineer of the North Eastern Railway Company, and that gentleman was conveyed by an engine belonging to the Great Northern Company from King's Cross to York, a distance of 191 miles, in 3 hours, 43 minutes, including a stoppage of 8 minutes at Newark for water and lubricating the engine.—*Mechanics' Magazine.*

By a very simple apparatus, invented by Captain Anderson, every part of the bottom of the *Great Eastern* was thoroughly scrubbed before she started on her present expedition. How much this was wanting may be judged from the fact that in many parts the muscles were in clusters of more than two feet thick upon her. Getting rid of this rough, shapeless mass from under her entire length will add at least a knot an hour to the vessel's speed.

Of the total heat given out by the combustion of the food, a man can make a fifth available in the form of actual work, while it has never been found possible to construct a steam engine that could utilize more than a ninth of the energy of the fuel burnt under the boiler.

COMMANDER WARREN has patented a plan for stopping shot holes or leaks in iron ships by sheets of lead fastened over the damaged part by means of screws acting on the outside of vulcanized india-rubber suckers.

MR. EUGENE TERRY, of New York, and M. Ernest Watelet, of Paris, have first made the ascent of Mont Blanc for this season with perfect success. They were accompanied by Edouard Cupelin, the well-known guide.

CONSIDERABLE deposits of bismuth in combination with copper are found in New Zealand; and it is said that an effectual and economical process for the separation of the two metals has been devised.

THE consumption of petroleum in Europe in 1864 was 30,000,000 gallons, against 16,000,000 in 1862; the probable consumption in 1866 is estimated at 90,000,000 gallons.

THE amount of pig iron exported to England by the American Colonies from 1728 to 1768 was about 75,000 tons, of which 26,000 were exported from 1761 to 1768.

#### NEW INVENTIONS.

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

MACHINE FOR PRESSING AND MOLDING PEAT.—M. B. STAFFORD, New York City.—This is a machine for pressing and molding peat in an expeditious manner and by a continuous rotary motion of the driving shaft; it consists of a framing, at each end of which there is a roller for an endless band or chain of molds to pass over. A plunger is arranged to work into the molds as the latter pass underneath the former, and a hopper is placed over the molds from which they are supplied with peat before they reach the plunger.

SEWING MACHINE.—A. WARTH, Stapleton, N. Y.—This invention relates particularly to improvements in the Wheeler & Wilson sewing machine, whereby the needle feed is adapted to said machine, and various defects in the construction of these machines are obviated.

STEAM PACKING.—FRANCIS WRIGHT, Galesburg, Ill.—This invention relates to a packing which is intended particularly for piston rods of steam engines, and which requires little attention, and works with the least possible loss by friction.

BLACKING CASE AND NIGHT CHAIR.—J. H. DOUGHTY, New York City.—This invention relates to a blacking case which is arranged in a suitable box under the seat of a chair, stool, settee, or other similar article. In the same box, and under the blacking case, may also be placed a dressing case and a night chair of suitable construction, and so arranged that its cover closes down tight to prevent the escape of unpleasant odors. Under the box is a boot-jack, which is made to slide in and out, and another boot-jack may be hinged to the side of the box or chair.

SPINNING JACK.—GILBERT DAWSON, Rockville, Conn.—The object of this invention is to stop the roping or roving drums from slipping around or continuing their rotation after the roping gear has been disconnected.

COLLAR FASTENING.—JAMES PROUD, New York City.—This invention relates to a novel fastening for attaching or securing a collar to a shirt, with which all danger of soiling or injuring the collar is prevented.

WHEAT DRILL.—GEORGE ZORGER, Greensburg, Ind.—This invention consists in certain modifications and peculiarities of construction, whereby several important advantages are obtained.

FORCE PUMP.—EDWARD B. HARRIS, Wilmington, Ill.—This is a double-acting force pump, by which water may be elevated with a very moderate expenditure of power, and with a simple arrangement of parts.

QUARTZ CRUSHER AND PULVERIZER.—JOHN MARRIS, Isle Royal Mines, Lake Superior, Mich.—This improvement consists in the arrangement of a feed table which revolves between the wheels, at a less speed, and on which the quartz is fed in such a manner that by the action of said feed table the quartz is easily distributed and exposed to the action of the millers.

HEAT REGULATOR AND DAMPER.—JOSEPH A. JACOBS, Pittsfield, N. H.—This invention relates to a regulator or damper which is made in the form of a double grate, the two parts of which are connected by a sliding crank shaft, in such a manner that by turning the crank shaft the bars of the upper grate are raised above the surface of the bars of the lower grate, and the draught is merely checked, but by imparting to the crank shaft a sliding motion, the bars of the upper grate can be made to cover or uncover the openings between the bars of the lower grate, and the draught can be regulated with the greatest nicety.

PAVEMENT.—D. HUESTIS, Cold Spring, N. Y.—This invention consists in the use of iron boxes with or without dovetailed composition or metal parts, and the interior filled with cement so that the composition face, together with the outer portions of the iron box, with intersecting grooves, constitutes the traveling surface. The composition or metal face is dovetailed into the interior of the box and combined with the cement so that the pressure arising from the weight imposed upon any part of the box will not cause an elevation or depression of any portion.

COMBINED EASY-CHAIR AND WRITING DESK.—WM. A. E. ERLMAN, Milwaukee City, Wis.—This invention consists in so attaching the back of a chair to its body, that when so desired, it can be swung over and into a horizontal position or nearly so, with its rear side uppermost, and there supported, with the seat portion of the chair free, so that the chair then can be used as a writing desk or table.

SPINNING MACHINES.—THOMAS G. ODELL AND BOYD GLOVER, Camp Point, Ill.—The object of this invention is to produce a spinning machine for domestic use which can be used in an upright position standing on a common table, or in a horizontal position clamped to the edge of a table.

TWEED IRON.—JAMES F. MAGUIRE, East Boston, Mass.—This invention has for its object to furnish an improved tweed iron for blacksmith's forges, and it consists principally in combining a water grate with an air chamber.

IMPLEMENT FOR SHARPENING KNIFE BLADES.—JOSEPH MC KNIGHT, Pomeroy, Ohio.—This invention consists in so securing two cutters for sharpening blades to a suitable handle, that they can be adjusted with regard to each other, according to the bevel desired to be given to the cutting edges of the knife blades.

HARNESSE NAILS.—F. R. REYNOLDS, Newark, N. J.—The object of this invention is to furnish an improved, convenient and simple mode for forming soft metal plated heads upon harness nails.

SELF-LUBRICATING JOURNAL BOX.—ALBERT R. SHERMAN, Natick, R. I.—This invention consists in the arrangement of caps, which catch over the ends of the journal box and revolve with the shaft, in combination with a brush or scraper, so that the oil which is forced out at the ends of the journal box and which collects in the caps, is returned to the journal, and the lubricating material is thus used over and over again until it is spent.

HORSE HOE.—DANIEL HARRIS, Canaan, Me.—The invention consists in the construction of two adjustable mold boards and a stave connected together and applied to a beam so as to form a very simple implement and one which will perform the work thoroughly.

BEATER PRESS.—J. A. MCGILLIVRAE, Dyer, Ind.—This invention consists in a novel construction of the press, whereby great strength with durability, simplicity and economy in construction are obtained, and a uniform adjustment of the levers and platen at the termination of the upward movement of the latter. The invention also consists in a novel construction and arrangement of the windlass and tripping apparatus.

SALVE.—GEORGE BACKETT, New York City.—This invention relates to a salve especially intended for use upon boils, sores, and other eruptions of the skin or flesh; cuts, wounds, and other bruises, abscesses, etc.

GUIDE.—J. T. CAPEWELL, Woodbury, Litchfield county, Conn.—This invention relates to a guide for folding the edges of straps over and upon each other, especially intended for the manufacture of harness reins, and is to be used in connection with a sewing machine.

VALVE LOCK.—C. C. TORRENCE, Ripley county, O.—The object of this invention is to provide a lock to secure any kind of slide throttle valve and prevent its being opened unless by one having a key.

TRELLIS OR RACK FOR VINES.—B. F. ELLIOTT, Cedar Rapids, Iowa.—The object of this invention is to so construct a trellis for vines, that in autumn or the fall it can be raised or lowered without removing or detaching the grape or other vine from it.

PORTABLE EVAPORATOR.—S. B. MAULSBY, Indianapolis, Ind.—This invention relates principally to combining skimming chambers and a finishing pan with the revolving pan, and to the construction of the skimmer to be used therewith.

STOVE.—THOMAS WHITE, Quincy, Ill.—This invention relates to stoves for heating purposes, and is intended to secure economy in the use of fuel, together with such a protracted or long-continued circulation of the gases and hot air from the fire chamber before they escape from the stove as to cause them to part with the greater part of their caloric while yet in the stove.

**GANG PLOW.**—WILLIAM T. ROGERS, Quincy, Ill.—This invention consists in so arranging a gang of plows on a carriage, that they may be easily unshipped, and cultivator teeth substituted for them. It further consists in an arrangement of devices applied to the driver's seat, rendering it adjustable to suit the inclination of the seat bars.

**CHURN.**—JOHN YOUNG, Adrian, Mich.—The cream is forced through apertures in the dasher, and made to circulate in grooves which are concentric with the dasher shaft, one of the grooves being in the upper and the other in the under surface of the dasher, the effect of which is to produce unusual agitation and friction.

**CULTIVATOR.**—JOHN N. ARVIN, Valparaiso, Ind.—This is a novel manner of arranging the inside shovels of the plow, which may be adjusted laterally by the action of the feet of the driver so as to conform to the sinuosities of the rows of plants, and all of which are capable of being raised out of the ground when required.

**PLOW.**—HUBBARD MARTIN, Taylorsville, Ky.—This invention relates to that class of plows in which metal is wholly used in the construction. The object is to obtain a plow with a beam and handles constructed of wrought iron, and in such a manner as to insure strength with lightness and durability.

**SCREW PLATE.**—NICHOLAS ZILLIER, New Castle, Del.—This is an improved screw plate for cutting the threads upon screws, simple in construction, and easily adjusted, so as to cut the threads upon screws of any desired size without changing the dies.

**KNIFE AND SCISSORS SHARPENER COMBINED.**—JAMES J. RUSS, Worcester, Mass.—This invention consists in the combination, with a novel constructed stand, of a sharpener plate, which is so secured to one of its sides as to be adjustable thereon. Against the edges of this plate the knife or scissors blades are sharpened.

**WIND WHEEL.**—C. NICKERSON, county, Ill.—This invention consists in forming the wheel with two sets of vertical wings, leaving their upper and lower ends secured in circular heads, which are keyed on a vertical shaft, one set of wings projecting further out from the wheel shaft than the other, and the outer and inner wings being placed alternately in the wheel, whereby the wind acts first against the outer and then against the inner ones, and escapes through the wheel, so that the wheel requires no change in position to suit the direction in which the wind may be blowing.

**MANUFACTURE OF WRENCHES.**—HENRY W. PELL, Rome.—This invention consists in subjecting a straight bar of iron of the requisite length, width, and thickness, to the action of a series of dies by which a head similar in shape to the ordinary heads of wrenches is formed thereon, with the full strength of the iron retained.

**DRIVING WELL TUBES.**—CALVIN SHEPARD, Kattelville, N. Y.—The object of this invention is to provide more efficient and speedy means for driving or sinking well tubes than have been known or used hitherto.

**LADY'S GARTER HOLDER.**—E. T. BURROWS, Mystic River, Conn.—This invention consists in a soft, flexible band, which is to be clasped around a lady's leg, next the skin, over which the stocking is to be drawn, and the usual elastic garter placed so as to encircle the stocking directly over the band, and thus all uneasiness occasioned by the elastic binding the leg too tightly is obviated; beside this, the stocking is held up more securely and neatly.

**FILLING MACHINE.**—OSCAR PLACE, Brooklyn, N. Y.—This is a machine for filling uniformly packages of farina and similar substances that will not clog in flowing through small apertures.

**CLOTHES WASHING RUBBER.**—HIRAM BURK, Mineral Point, Ohio.—The object of this invention is to furnish an improved clothes washing rubber, to be attached to a wash or rubbing board, to take the place of the hands in washing clothes.

**POTATO WASHER.**—JOSHUA H. WILLIAMS, East Craftsbury, Orleans County, Vt.—This invention has for its object to furnish a machine by means of which potatoes may be quickly and thoroughly washed.

**PUMP.**—JOSEPH W. DOUGLAS, Middletown, Conn.—With this invention a double-acting pump with only one side pipe is produced. The piston rod is hollow and receives the liquid, which is forced upward through the piston, while the liquid which enters the pump cylinder through the side pipe is received in the top of the piston, and forced thence through the piston rod to the top of the pump.

**SULKY PLOW.**—PETER YOUNG, El Paso, Ill.—This invention relates to the mode of operating sulky plows, whereby the movements of the plow are managed and controlled with the greatest facility.

**ROTARY BLOWER.**—P. H. & F. M. ROOTS, Connersville, Ind.—This invention consists in the peculiar construction of the revolving abutments of a rotary blower, each of the abutments being composed of two pistons which form arcs of circles in combination with intervening recesses, which also form arcs of circles, so that four essential points are formed at which the abutments come in contact during their revolution, and that by rendering the contact at these points air-tight, the revolving abutments are enabled to produce the desired effect; it consists also in constructing each of the revolving abutments of two or more metallic crossheads fastened on a suitable shaft, and made square, polygonal, etc., in combination with wooden staves, which are bolted to the crossheads, and then dressed to the proper shape.

**MARINE CAR.**—GEORGE H. YOUNG, Charlestown, Mass.—This invention consists in the application, for the purposes of marine locomotion, of a system of articulated pontoons in the form of one or more endless belts, in combination with a suitable vessel, in such a manner that the pontoons serve the double purpose of buoys and also of buckets or propellers, and thereby the resistance of the vessel moving in the water is greatly reduced.

**HORSE RAKE.**—JOHN N. BAXTER, Greensburg, Ind.—The object of the invention is to obtain a revolving horse rake which will operate with but little friction, be simple in construction, and economical to manufacture.

#### NEW PUBLICATIONS.

**NEW MUSIC.**—Oliver Ditson & Co., of Boston, the well-known publishers of music, have just issued the following new pieces for the piano:—*Il Balen, Trovatore, Soldiers' Chorus, Kathleen Aroon, Nocturne, Crispino e Comare, Gems from the German. Bring forth the Bride, Harmonies, Dance Music, etc.*

## Hints & Queries.

**J. B. H., of N. Y.**—The term "cupola" is applied to those furnaces used for the second fusion of iron, so named from the dome which formerly was placed at their tops to lead the smoke to the chimney. The common blast furnace for reducing the ores is much more entitled, from its form, to the distinctive term "cupola" than the common foundry furnace. But that which is used in ordinary iron casting is commonly called a cupola furnace.

**E. A. W., of Philadelphia.**—The offensive smell of lard oil may be removed by straining it, and agitating it at the same time with water containing about one per cent caustic soda.

**L. P. L., of N. Y.**—You are correct in your supposition that the heat of the blood does not materially vary in summer or winter.

**R. M. Du B., of N. J.**—Use good hydraulic cement. It is the only cheap substance that will make a wall, exposed to water, safe and sound.

**V. McG., of—**—Your coloring extracts ferment in this hot weather; keep them in a refrigerator or prepare them oftener and they will not smell badly.

**N. J. Co., of N. H.**—Hardened steel can be etched by any acid which bites iron. A mixture of nitric and sulphuric acid, equal parts, bulk for bulk, with an equivalent, in bulk, of water will be found to be what you want.

**E. H. H., of Ohio.**—Copper bears a proportion of tensile strain to boiler iron of 17 to 31, or about one-half. It does require "heavier material," or rather, thicker material, for larger surfaces than for small, to resist pressure. "Bourne's Catechism" will give you the proportions.

**M. E., of N. Y.**—We do not think glass would answer your purpose as a step to your turbine. The shaft is probably cast iron, and great friction would be created between cast iron and glass, working in water. Rock maple, lignum-vitæ, or hickory prepared by boiling in oil and used with the grain parallel with the shaft, or vertical, would make as good a step as you can obtain. Try it.

**S. F. W., of Iowa,** finds a difficulty in getting a molder to draw the patterns for sheet metal swages without disturbing the sand and injuring the molds, and asks if some better material than sand cannot be used which will withstand the heat of melted iron and preserve a rigid mold. He suggests plaster of Paris. A good molder can draw a properly made pattern right. The molds may be made more delicate and perfect by a mixture of loam with your sand. Plaster of Paris will not stand molten iron. It crumbles and loses shape. Try loam with your sand, making sure of having vents for your gases, then dry your mold by a fire of shavings, and if your patterns are properly made and your molders conscientious and capable, you will have no trouble.

**P. C. S., of R. I.**—The force of expansion of any body is evidently equal to the force required to effect a compression to the same amount. In the larger treatises on physics you will find tables of compressibility, 1 atmosphere of pressure condenses mercury .00000295. Another way of determining the expansive force of mercury is based on the dynamic theory of heat; the expansive force due to a unit of heat is 772 foot lbs. The expansive force of mercury appears to be about twice that of water, and greater than that of any other liquid yet tested; of course it is practically irresistible.

**W. B. S., of Mich.**—There is no difficulty in keeping the gases separate when decomposing water by the battery and thus we are sorry to find that your ingenuity has been misdirected. The real trouble in the case is the cost of materials consumed. To decompose a pound of water by the battery requires at least 32 lbs. of zinc and about 60 lbs. of acid.

**R. O., of N. Y.**—You are correct in supposing there is more heat in a cubic foot of water than in a cubic foot of air, both being of the same temperature. If you represent the heat in 1 lb. of water by 1, the quantity in 1 lb. of air would be .237. But as water is about 800 times heavier than air, it follows that the heat in the cubic foot of water must be over 3,000 times that in the cubic foot of air.

**C. L., of Pa.,** wants information on the use of belts for polishing wood.

**J. H. A., of Pa.**—We have not received the minerals in question.

**E. F. S., of Pa.,** supposes two cylinders of the same diameter and length; one of the cylinders is solid and the other is hollow and contains a smaller cylinder which can easily roll in it; the solid cylinder is of the same weight as the other two. Query: If the solid cylinder and the hollow one with its contents be placed upon a level plane which would require the greater force to roll it? We answer: the force required in both cases would be the same for the reason that there is the same weight of matter to be moved and the same friction surface. Over an uneven road it would probably be more trouble some to roll the hollow cylinder, it would go along by jerks like a barrel half filled with water.

**J. F. L., of Ohio.**—In evaporating sirup it is advantageous to have the sirup as shallow as possible, and in motion; in such circumstances the sirup boils at a lower temperature, and there is an economy of fuel. We understand that metals, as well as all other substances, when they are solid invariably contract with cold. The point of maximum density of water is about 37 deg.; from this point to solidifying it expands by cold, but as soon as it has become solid it contracts by cold.

**Van K. & Co., of Ill.**—It seems rather strange that men should keep on inventing water wheels to pump their own

water, which is the case in the drawing you send us. A ram is to throw water up on to a wheel, and the wheel is to pump water into a tank for the ram. This is a mechanical illustration of what politicians call the balance of power.

**L., of N. Y.**—It is not unusual for boiler plates to crack along the line of rivets. It is often caused by using a drift pin to bring the sheets fair, and is as likely to be the inner as the outer plate. If the driving belt slips on a large pulley it must be owing to some local peculiarity which can be found by search.

#### SPECIAL NOTICES.

Oldin Nichols, of West Roxbury, Mass., has petitioned for the extension of a patent granted to him Oct. 12th, 1852, to which additional improvements were annexed March 30th, 1854, for an improvement in Grinding Mills. The petition will be heard on Monday the 24th day of September next.

Peter Geiser, of Greencastle, Pa., has petitioned for the extension of a patent granted to him on the 19th day of October, 1852, for an improvement in Grain Separators. The petition will be heard on Monday, the 1st day of October, 1856.

D. D. Allen, of Adams, Mass., has petitioned for the extension of a patent granted to him on the 19th day of October, 1852, for an improvement in Tool for Cutting Pegs out of Boot soles. The petition will be heard on Monday, the first day of October next.

Alber Gardner, for himself, and as Administrator of William L. Hunter, of Cincinnati, Ohio, has petitioned for the extension of a patent granted to the said Gardner, as said Administrator, and to himself, October 25, 1852, for an improvement in Plows. The petition will be heard on Monday, the 8th day of October next.

### 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 Caval.	\$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	\$20
On application for Extension of Patent	\$20
On granting the Extension	\$20
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)	\$20

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

**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 enclosing \$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.

**Improved Breech-loading Cannon.**

This method of loading cannon at the breech consists in having a movable arm, A, jointed to the cannon so that it swings freely on its axis. In this arm are the chambers, B, which contain the charge. Figs. 1 and 2 show the arrangement. The vents are in the side of the chambers where they can be easily

hypo-chlorate of lime with manganese and silicic acid, or with dry sulphate of iron, the product of whose decomposition is caused to pass upon platinated pumice stone, turning to profit the sulphurous acid resulting from the process to the preparation of sulphites. The invention, is, therefore, essentially the production of light, by placing the oxide of spongy

crack from unequal expansion, we shall owe it to the perseverance of inventors.

The latest invention in this line is illustrated herewith. It is a glass chimney with spiral grooves extending from top to bottom, the object being to equalize the expansion of the glass when heated, and prevent it from breaking.

The engraving shows the invention very clearly. The small figure underneath the principal indicates the amount of corrugation. Patented by H. C.

Fig. 1

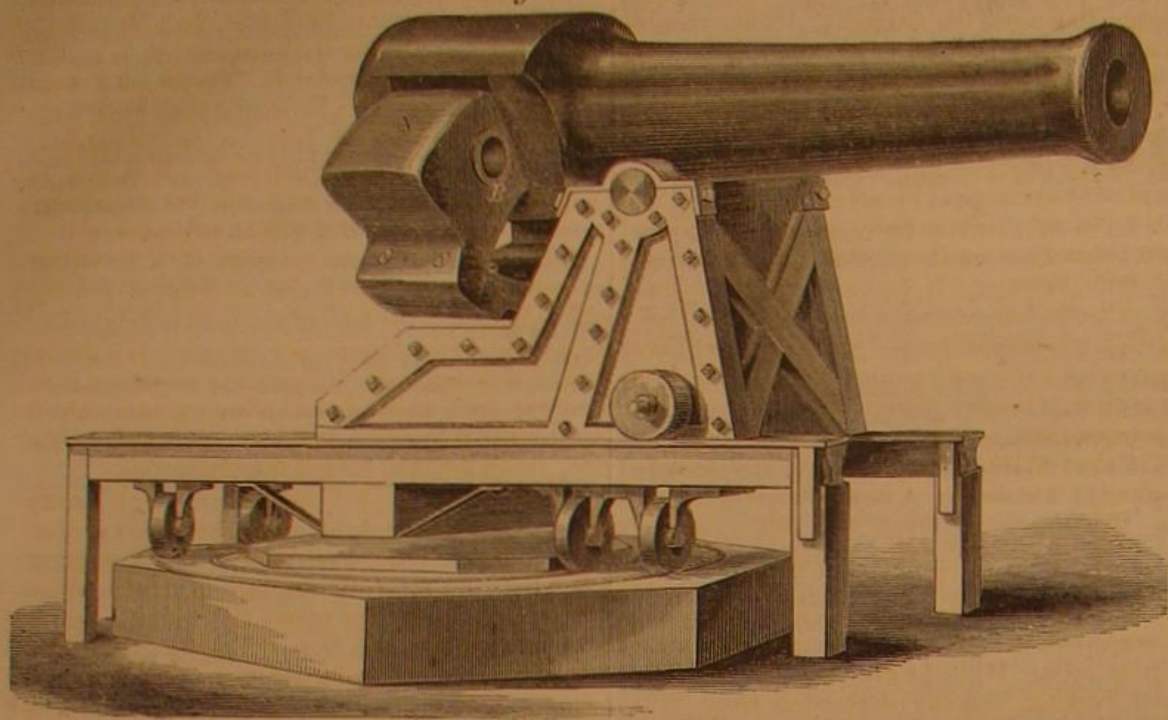
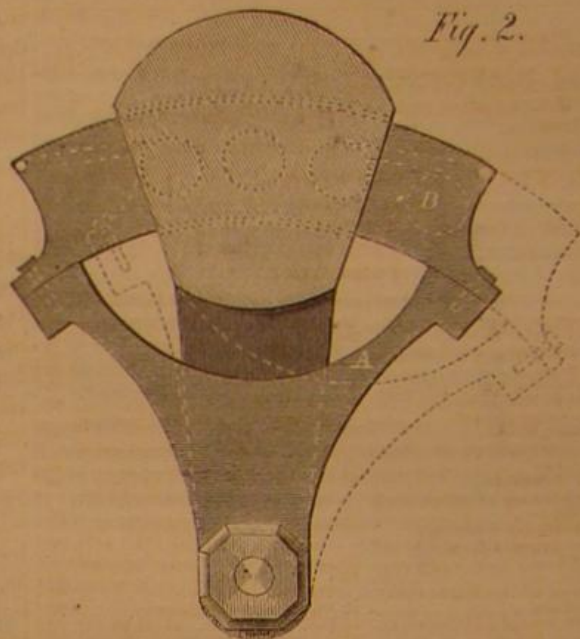


Fig. 2



**MILLER'S BREECH-LOADING CANNON.**

manipulated at each discharge, and are also convenient for firing.

As each shot is fired, or as one chamber is brought into line with the bore, the other is thrown back far enough to allow it to be loaded, so that a continuous discharge can be kept up so long as the temperature of the gun permits. The dotted lines in Fig. 2 show the position of the vibrating arm when moved so as to bring one chamber in line with the barrel of the gun.

One half the right may be bought on reasonable terms by addressing the inventor, John A. Miller, of Paducah, Ky., by whom it was patented Feb. 7, 1865.

**New Oxide of Magnesium Light.**

It is well known that the oxide of magnesium is practically infusible, and that it has the property of being volatilized, but in the smallest quantity, in a flame of oxygen and hydrogen mixed together, and without imparting any color to that flame. The oxide has also the property of spreading, on being placed within the flame, an intense, bright, and constant light, and which is admirably suitable to photography. Many magnesium salts, and particularly chloride of magnesium and carbonate of magnesia, have the property of leaving some oxide of spongy magnesium on being decomposed by the oxyhydrogen flame. Availing himself of a knowledge of these principles, Prof. Prospero Carlevaris, of Genoa, proposes to employ the process now to be described. A piece of chloride of magnesium, larger or smaller, according to the effects of light required, is placed upon a small prism of gas-retort coal, and upon it, through a small tube purposely made, the flame of the oxyhydrogen gas (the mixture of oxygen and hydrogen) is directed; or a prism, or even a small and well-compressed cylinder of carbonate of magnesia is placed within the flame from the same mixed gases. The chloride of magnesium or the carbonate of magnesia is directly decomposed and resolved into oxide of spongy magnesium, from which the intense, bright, fixed and constant light comes forth, causing all the chemical phenomena of diffused sun light. The gases of the said combination, which are pure hydrogen, or even ordinary illuminating gas, and pure oxygen, or even atmospheric air, flow separately from two different gasometers, and are mixed only in a very small tube at the end of the pipes. They can be prepared in the ordinary way when wanted in small quantities; if wanted on a large scale, pure hydrogen is prepared by causing steam to pass over incandescent charcoal. Oxygen is prepared with manganese, and

magnesium in a flame produced by a mixture of oxygen and hydrogen.—*London Mining Journal.*

**APPLEBY AND GOULD'S LAMP CHIMNEY.**

"If it were not for the chimney," said a friend to us recently, "the kerosene lamp would be perfect."

Fig. 1



Fig. 2



It gives a whiter light than gas, it is more steady, it is far cheaper, and there are no insolent collectors about it sticking red bills in your face every month."

The advantages mentioned are certainly obtained, and if we are ever to have a chimney that will not

Appleby through the Scientific American Patent Agency June 12, 1866. Address Appleby & Gould, Conneaut, Ohio.

**Report on the Springfield Rifle.**

The *Springfield Republican* says the military board, appointed for an examination of the various fire-arms now in use by different nations, have carefully examined sixty-one different rifles and muskets and have reported that the most effective, safe, and substantial arm, is the Springfield rifle with the Berdan improvement, which changes it to a breech-loading rifle. The board consisted of Major-Gen. Hancock, Buchanan and Griffin, Brig-Gen. Haynes, and Cols. Owens, Benton and Porter, and it is unofficially stated that the members were unanimous in their recommendation of the Springfield rifle. It is not alone in this country that the Springfield rifle is now in favor. Louis Napoleon, while casting about for the most effective arm for his army, came to the same conclusion with our own board of examination; an agent of the French Government lately bought of a Philadelphia machinist a full set of the machinery needed for the manufacture of the Springfield rifle for 100,000 francs in gold, and shipped it to France. This was before the report of our examiners recommending the addition of the Berdan improvement had been made, and one of the rifles with that improvement is now being made, and will be sent to France at once as a pattern. When the French Emperor fights he wants to fight successfully, and he seems to have full confidence in the value of our fire-arms and in the ingenuity of American mechanics.

**The "Lord Warden's" Engines.**

The *London Engineer* publishes a supplement to its issue of the 29th June, wherein working drawings, in plan section and elevation of the *Lord Warden's* engines, are given; the scale is one-fourth of an inch to the foot.

The engines have three cylinders each 90 inches diameter, 48 inches stroke, and are of the back-acting variety. There are many novelties in detail, but the most striking one appears to be the use of gearing to drive the main valves instead of eccentrics. There are four large gear wheels, each about 42 inches in diameter, between the main valves and the shaft, and these, through the intervention of a crank shaft, perform the work. It seems rather a perilous reliance to put faith in the teeth of gears to do such work, but we console ourselves with the reflection that the builders, Messrs. Maudslay & Field, probably know what they are about.

# 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.

27 Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions and advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attended to.

27 "The American News Company," Agents, 121 Nassau street, New York.

VOL. XV., No. 6, [NEW SERIES.] Twenty-first Year.

NEW YORK, SATURDAY, AUGUST 4, 1866.

## Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Shingle Machine.	79	Cementing Tin and Glass.	84
Tunnel Under Chicago River.	79	New Inventions.	84
How Burglars Operate on Safes.	79	Notes and Queries.	85
Our Special Correspondence.	80	Special Notices.	85
A Fine Tower Clock.	80	New Publications.	85
A Poisonous Spider.	80	Patent Office.	85
Boots and Shoes.	80	*Improved Breech-loading Cannon.	86
The Manufacture of Hair-cloth.	81	New Oxide of Magnesium.	86
Heavy Forgings.	81	*Light.	86
Granulation of Blast-furnace Slags.	81	*Appleby's Lamp Chimney.	86
Miscellaneous Summary.	81	Report on the Springfield Rifle.	86
The Advantage of Good Tools.	82	The "Lord Warden's" Engines.	86
Fleas.	82	Inventors—Their Labors and Rewards.	87
Influence of the Mechanic in Politics.	82	The Force of Wind.	87
An Unfortunate Inventor.	82	Disinfecting by Steam.	87
Chemical Notes.	82	Patent Claims.	88, 89, 90, 91, 92
*Telegraphic Cable.	83	Advertisements.	92, 93
*Saws and Saw Filing.	83	*Improved Corn Cutter.	94
Millstone Cement.	83	*Rowell's Movement.	94
Cement for Millstones.	83	How Gutta-Percha is Obtained.	94
Keeping Circular Saws in order.	83	Singular Freak of Lightning.	94
Mills for Grinding Paint and Printer's Inks.	84	*Nell's Adjustable Spring Bracket for Window Shades.	94
The Heating of Guns by Concussion.	84	Improved Cartridge Box.	94

## INVENTORS--THEIR LABORS AND REWARDS.

"The inexorable logic of facts" is rapidly correcting some popular errors in regard to the work and compensation of inventors. The idea that inventors are a sort of dreaming philosophers, isolated from the masses, and existing only in the laboratory and library, is a mistaken one; and not less erroneous is the notion that they are a class who sow that others may reap.

The time was, in the twilight of science and the dawn of the arts, when the inventor or discoverer environed his studies and his person with mystery, and derived a distinction from the secret which he professed to hold. To make it public would bring him no advantage, but take from him the homage of the ignorant. No paternal and enterprising government extended over him its protection of a patent law. The world was not ready for him. Chemistry was but a series of experiments to discover the art of the transmutation of metals or the elixir of life. Men, enriched with the lore of the ages and developed by constant study, were content to conduct their experiments with a view of ascertaining how to change the baser metals to gold, or to rival the antediluvians in length of life. Undoubtedly, although success did not wait on their efforts, those very efforts carried their own reward with them. But their studies and half-perfected discoveries remained like finger-posts to direct the investigations of those who came after them. The modern school of scientists owe much to the recorded observations of those who saw, in the means they used, an approach to the end they sought, but never reached.

If investigation and study ever descended from its stilts in the laboratory to the walks of common life, it was only to construct a toy wherewith to amuse the leisure of the inventor and to astonish the unlearned. The philosophers of the early ages were so jealous of their fancied distinction, that many of them died without leaving to posterity their richest legacies—the result of the experiments whose means they recorded. Or, if they left a record it was like the divinations of the Delphic priestess—ambiguous and couched in the form of a lingual puzzle. But despite these drawbacks, these men left us much to be thankful for. The shadows of the great minds who walked in the slant rays of the rising sun of civilization, are projected across the plane upon which our inventors travel.

From the chosen paths of these impractical think-

ers such men as Watt and Arkwright diverged, and sought the broad road of utility. In their hands the scientific toys of the old philosophers became useful agents for the improvement and elevation of the race. Here, then, was and is the true secret of the inventor's success. His aim should be something higher than a design to construct a wonder-working machine, or to show his independence of thought by altering or diverging from the works of others without completing a real improvement. Utility should be his guide and his aim. And it is not enough that he conjectures or speculates on what may be done, or that he even convinces himself by investigation and private experiment that his improvement is feasible. The true inventor must demonstrate the value of his improvement by actual experiment, on a scale sufficiently large to prove its value in practical use, before he is legally entitled to the distinction of the term inventor. It cannot be doubted that many valuable improvements now in general use, and yielding handsome annual incomes, would have borne another name and poured their profits into other pockets, if the first discoverer, in point of time, had possessed the necessary faith in his improvement, or the requisite energy and enterprise to have wrought out his discovery to a successful experiment. One may sit and dream from day to day and year to year over a conjectural improvement, but it will avail him nothing, however meritorious, unless he builds for it something experimentally stronger, as a foundation, than the "baseless fabric of a vision" rests upon. While he dreams another is waking and working, and the impractical visionary is compelled to see the laurels he thought himself entitled to worn by another.

The work of the inventor, then, is not only to devise and calculate, but to prove and demonstrate. He must be a man of energy as well as of thought—he must be enterprising as well as original. If he is independent enough to strike out a new path, he must not be content merely to survey it, but he must lay out the road, grade the surface, and propel himself and his improvement over it before he can claim toll of the world.

Here, then, is the reward of the inventor. He is no longer a visionary, suggesting in sphynx-like utterances the way to improvements, standing at the parting of the ways and pointing, but never traveling the road; but he is a moving, animated man, a man of business, a man of labor, clearing the obstructions from his path and leading the way. Pity for the fate of unfortunate inventors who never reap the seed they have planted, he does not need. His energies bear him through the season of anxious sowing and watering to the time of the abundant harvest. The time is past when inventors were the prey of the wealthy and unscrupulous. Judicious patent laws offer to all whatever protection the value of their discoveries entitles them to. The demand for improvements in the arts is such, that there is not in the market a more salable commodity than a valuable and practical invention. If the inventor has neither the capital nor inclination to engage in the manufacture of his improvement, he has his patent which represents capital and can command it.

No men in the community can more readily dispose of their wares at remunerative figures than the inventors of real improvements. A case came under our observation but a short time ago, when a young man from one of our Western States, in looking for a party to manufacture an invention he had just patented, sold the right to make and sell in the South and West for over one hundred thousand dollars.

Let inventors but confine their researches and experiments to the really useful, test their value until it can be demonstrated, and there will be no difficulty in securing the reward of their labors.

## THE FORCE OF WIND.

The thunder storm which followed the piteously hot weather of a fortnight since was preceded, in many sections of the country, by a high wind which blew down houses, uprooted trees, prostrated crops, and sent cattle in the pastures galloping before it as though possessed of devils.

It seems strange to see such terrible effects from an element that scarcely an hour before breathed

softly through vines and trifled with the quivering leaves of the maple, and we realize forcibly the power of this element from the results.

Winds are caused by changes of temperature; when the air is heated or rarefied, it rises, and from some other part of the country cooler air rushes through to supply the partial void, and thus the air is put in motion.

The force of wind is determined by an anemometer. These instruments have been made of various designs—some recording the force, and others requiring observation to determine it. The simplest form is that of a disk having a horizontal shaft fitted with a spiral spring working between two standards; these latter also support the shaft. It is easy to graduate the rod so that any number of pounds' pressure put upon the disk will be indicated by it.

Woltman's anemometer consists of a revolving fan which has an index and a train of gearing attached, so that the force of the wind is weighed by the number of revolutions per minute. It is graduated by choosing some still day and mounting it on a railway train moving at a known velocity, which is, of course, the same as if the air moved at the same rate; tables are then formed from such data.

A wind that moves but one mile an hour is hardly perceptible, and has, according to Smeaton, a perpendicular force on one square foot of .005 of a pound. A gentle wind moves at the rate of four miles an hour, and presses on one square foot .079 of a pound. A pleasant gale moves from ten to fifteen miles an hour, and has a perpendicular force of from .492 of a pound to 1.007 pounds. A high wind moves with a velocity of thirty and thirty-five miles per hour, and has a perpendicular force of from 4 to 6 pounds avoirdupois on one square foot. A hurricane travels at the rate of eighty miles an hour and has a force of 31.490 pounds per square foot.

It is not difficult to comprehend from this table how mighty oaks that have stood for years are leveled in an instant, and paths made through the forest where the stubborn undergrowth defied the power of man. Nor yet to understand how railway trains are thrown from the track, or ships tossed on the sea like cockle shells thrown on the strand by the falling tide. Man's power is great, but there is a mightier than he, and the winds and the waves obey Him.

## DISINFECTING BY STEAM.

The use of steam at a high temperature as a disinfectant was tested on Thursday, July 13th, at the house of Metropolitan Engine Co. No. 1, in Center street, this city, under the superintendence of Dr. Bell, the introducer of the process. Steam was raised on one of the fire engines, and discharged into an iron chest three or four feet square, containing a coil of iron pipe. A small quantity of carbolic acid was placed in the super-heater. Under this vessel a fire was built to give the requisite degree of heat to the steam. It was found, after a trial of fifteen minutes, that, by a self-registering thermometer, the temperature of the room to be disinfected was raised to 150 deg., and oysters and eggs were thoroughly cooked.

That a sufficient degree of heat can be evolved by this process to destroy the germs of disease which may exist in the atmosphere, seems to be probable, but the one objection is in regard to its want of facility of application. In hospitals and similar institutions this objection would not have the force it would applied to private dwellings. It is probable that the usefulness of this process will be greatly limited by circumstances. Its use cannot become so general as its claimed advantages would seem to warrant.

**DESTRUCTION OF A BRIDGE.**—A tornado, accompanied with hail, on the evening of the 25th ult., utterly destroyed the magnificent bridge of the Philadelphia, Wilmington, and Baltimore Railroad, over the Susquehanna River, at Havre de Grace. The bridge has been in course of construction for several years and was almost completed. The company have begun rebuilding it, and it is believed it will be completed for travel by the first of January next.

A TRAIN recently ran forty-three miles on the Hudson River Railroad on 4,300 pounds of peat.



ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JULY 24, 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.

**56,503.—MACHINE FOR PULLING UP OLD COTTON AND CORN STALKS.—William Altick, Dayton, Ohio.**

I claim, first, The combination of the two rollers, M M, when one is made rigid and the other flexible or yielding in its bearings, substantially as and for the purpose specified.

Second, The arch or bow, D, when used with the frame pieces or bars, A A, and the rollers, M M, as and for the purpose herein specified.

Third, The arrangement of the shield, V, with the arch, D, and rollers, M M, substantially as and for the purpose set forth.

Fourth, The plate, S, constructed as set forth and arranged under the rollers, as and for the purpose described.

**56,510.—CARRIAGE JACK.—Maurice Andriot, Mount Washington, Ohio.**

I claim the arrangement of the standard, A C, fulcrum pin, D, lever, E F, self-locking chock, G, and trigger, K.

**56,511.—CULTIVATOR.—John N. Arvin, Valparaiso, Ind.**

I claim the arrangement of the joints, b, universal joints, H, link, O, arms, P, and chains, J, in combination with the curved plow beams, G M, and shaft, E, operating in the manner and for the purpose herein specified.

**56,512.—HOOP SKIRT.—James E. Atwood, New York.**

I claim constructing a hoop skirt of horizontal hoops, and the pendants, B B B, combined and arranged substantially as described and set forth.

**56,513.—SALVE.—George Backett, New York.**

I claim the salve made of the several ingredients, and mixed together in or about the proportions stated for the purposes specified.

**56,514.—STOVE PIPE DRUM OR HEAT RADIATOR.—F. A. Balch, Hingham, Wis.**

I claim, first, The pure air chambers, G G', connected with each other by the pipes, H H, which pass through the smoke pipe, C C, substantially as shown.

Second, The pure hot air chamber, G', provided with the register holes, J J, the valve flue, K, and the valve, L, substantially as described.

Third, A radiator with the pure air chambers, G and G', the smoke chambers, F and F', the smoke pipes, C C', and the pure air pipes, H H, constructed and arranged substantially as described and shown.

**56,515.—SASH SUPPORTERS.—Silas D. Baldwin, Chicago, Ill.**

I claim the combination of the elastic ball, a, spring, b, and retracting rod, c, with the case, C, provided with the inclined planes, arranged and operating substantially as set forth and specified.

**56,516.—BOTTLE STOPPER.—Arthur Barbarin, New Orleans, La.**

I claim the combination with stoppers for bottles, jars, and other receptacles, of the elastic fastening device, the whole being constructed and arranged for operation, substantially as herein described.

**56,517.—HORSE RAKE.—John N. Baxter, Greensburgh, Ind.**

I claim a frame provided with two sets of rake teeth, D D, projecting from opposite sides, in combination with thills, E, attached to the end pieces, C C, of the frame by pins or journals, d, secured to the inner ends of the thills and passing through oblong slots, c, in the end pieces, substantially as and for the purpose set forth.

**56,518.—DUMPING CAR.—James Braidwood, Wilmington, Ill.**

I claim the frame, c, constructed substantially as herein recited, in connection with a rail track, and for the dumping of the cars, all constructed and operated as described.

**56,519.—CLAMP FOR HOLDING SAWS.—Jesse Briggs, Stuyvesant, N. Y.**

I claim the construction and arrangement of the frames, A A', jaws, B B, hook projections, c', pins, c, cam, C, and lever, D, in the manner herein described and represented.

**56,520.—CHURN.—George N. Brigham, Montpelier, Vt.**

I claim the double or forked beaters, they having ribs or raised beads on both edges, as herein described, the same being so constructed as to operate in combination with reverse angular breaks on both sides and ends of the receptacle for containing the cream, so as to produce currents and counter currents toward the center of the revolving shaft, for the purposes herein set forth.

I claim the construction and arrangement of the beaters, B B, with their bevel side openings, b b, and ribbed edges, a a, the breaks, c c, and breaks, d d, top breaks, e e, for the purpose of churning and working butter, substantially as and for the purposes herein specified.

**56,521.—HARVESTER RAKE.—R. D. Brown, Covington, Ind.**

I claim, first, The arrangement of the forked pin, Q, rotating at the end of the slot, R, as herein described and for the purposes set forth.

Second, I also claim the arrangement and combination of the ratchet, P, and pulley, N, with the reel, M, for the purpose of tightening the belt, as herein described.

**56,522.—REAPING MACHINE.—Robt. Bryson, Schenectady, N. Y.**

First, I claim the arrangement of the gimbal or universal joint, d, with the two parts, c c', of an extensible shaft, when one part of the said shaft drives an endless belt, which operates a reciprocating rake arranged to move through a slatted platform, and the other part is attached to the draft frame and transmits the motion of the driving wheels to the gearing which drives the rake, in combination with a hinged joint harvester, all in such manner that one part of the extensible shaft maintains an unchanging position with respect to the grain platform, and the other part thereof maintains an unchanging position with respect to the draft frame, as set forth.

Second, The construction and arrangement of the parts, c c', for the purpose of forming an extensible joint shaft for a hinged joint harvester with a rake attachment, substantially as herein described.

Third, The construction, arrangement and combination of the

rake head carrier, G, rails, g' g' and g2, rake head, I, spring slide, h2, spring catches, j j', pin, g, and endless belt, f f', substantially as and for the purpose set forth.

Fourth, The combination of the slot, c3, adjustable pin, c2, endless rake moving belt, f f', and reciprocating rake, h h', substantially as and for the purpose described.

Fifth, The combination of the rake head carrier, G, rake, h h', spring catches, j j', spring slide, h2, and endless belt, substantially as and for the purpose set forth.

Sixth, The rectilinear moving rake spur gears, d d', and section, c', of an extensible shaft, arranged on a hinged joint platform, as described, in combination with the gimbal or universal joint, d, section, e, of extensible shaft, bevel gears, and draft frame, all arranged and operating in the manner herein described.

**56,523.—CLOTHES WASHING RUBBER.—Hiram Burk, Mineral Point, Ohio.**

I claim an improved clothes washing rubber, formed by combining with a rubber board, A, having rubber flanges, a', of a plate, D, or its equivalent, a handle, c, the hinged and pivoted arms, F and G, substantially as described and for the purpose set forth.

**56,524.—GARTER.—Edmund F. Burrows, Mystic River, Conn.**

I claim a device for holding ladies' garters in their places upon the stockings, consisting of a flexible strip or band, a, covered with any suitable material or fabric, and provided with raised edges, e e, the said device to be clasped around a lady's leg, underneath the stocking, and the stocking held up by a common garter encircling the stocking directly over the band, substantially as shown and described.

**56,525.—COOKING STOVE.—Esek Bussey, Troy, N. Y.**

What I claim is, A three-flued cooking stove, having the central flue extended so as to inclose on the sides and bottom the culinary boiler or hot water reservoir, B, the latter being so arranged as to rest upon or against the edges of the sides of said central flue, so as to constitute the interior side or wall of the same, substantially as set forth.

**56,526.—VARNISH.—John M. Butcher, North Lewisburg, Ohio.**

What I claim in this invention is the compounding of the several ingredients hereinafter named, in the proportions named, in the manner pointed out, and for securing the advantages enumerated.

**56,527.—SEWING-MACHINE GUIDE.—J. T. Caperwell, Woodbury, Conn.**

I claim a guide made conical or tapering from end to end, and provided with suitable ways or guides for the edges of the strap or material passing through it, so that when the strap issues from the smaller end of the said guide, its edges will be lapped or folded over each other, either more or less, substantially as herein described and for the purpose specified.

**56,528.—APPARATUS FOR MAKING CHARCOAL.—K. S. Chaffee, Cambridge, Mass.**

I claim the application of the condenser to the kiln by extending such condenser as a pipe around the kiln, and supporting it by means of series of branch pipes leading from it into the kiln, and combining with such condenser a discharge pipe, b, to extend from it, as set forth.

I claim the above-described arrangement of the condenser with respect to the kiln, viz., so as to encompass it and connect with it, substantially as described.

**56,529.—FILLING FOR SAFES.—Robert A. Chesebrough, New York City.**

I claim the use of bone black for filling in between the inner and outer walls of a safe or vault to render the same fire proof.

**56,530.—VAPOR STOVE.—Samuel Child, Jr., Baltimore, Md.**

First, I claim, in apparatus for generating heat in vapor stoves as above described, regulating the supply of fluid to the retort or heating chamber, in the manner and by the means hereinbefore specified, that is to say, by locating the valve which regulates the flow of the oil or other fluid at or near the point where the fluid enters the said retort, substantially as and for the purposes herein set forth.

Second, I claim in combination with the retort or heating chamber of a vapor stove and valve seat located at or near the point of junction of said retort, with the pipe which connects it with the fluid reservoir, as specified, the valve constructed and arranged so as to operate on the axis of the said pipe, substantially as and for the purpose herein shown and described.

**56,531.—EXPANDING FRAMES FOR SOLDERING FRUIT CANS.—John K. Cook, Richmond, Ind.**

I claim the arrangement and combination herein described of an expanding frame for soldering fruit cans, capable of being withdrawn through the hole in the top of the can, when finished, as and for the purposes substantially as set forth and described.

**56,532.—SPINNING JACK.—Gilbreth Dawson, Rockville, Conn.**

First, I claim stopping the roping drums in spinning jacks from slipping round or continuing their rotation after the roping gear has been thrown out, by means of a brake acting automatically on a pulley placed on the drum shaft, substantially as described.

Second, I also claim the brake lever, H, in combination with the elbow lever, C, substantially as described.

Third, I also claim the combination of the brake, the lever, C, and the shoe, D, substantially as described.

Fourth, I also claim the combination of the brake, the lever, C, and the slide, J, constructed and operated substantially as described.

**56,533.—MEDICAL COMPOUND.—P. M. Devos, New York City.**

I claim a medical compound or composition when formed of such materials as will impart to it the characteristics herein described, and when used substantially in the manner and for the purposes specified.

I also claim a medical compound made by mixing camphor, nux moschata, or nutmegs and capsicum, or red pepper, in combination with any suitable disinfectant, whether one or more in number, and when mixed together in or about the proportions named, and used substantially as and for the purpose specified.

**56,534.—REAPING MACHINE.—Owen Dorsey, Newark, Ohio.**

First, I claim combining rectilinear-reciprocating platform with a vibrating fender, in such manner that the grain, after it falls upon the fender, shall be deposited upon the platform, conveyed, and by the latter delivered upon the ground at one side of the machine, substantially as described.

Second, The combination of a rectilinear-reciprocating platform, which is composed of slatted bars, with a vibrating slatted fender, substantially as described.

Third, Automatically delivering the cut grain from one side of the machine by means of a platform which has a rectangular and vibrating movement, substantially as described.

**56,535.—COMBINED BLACKING CASE AND NIGHT CHAIR.—J. H. Doughty, New York City.**

First, I claim the box, B, containing the blacking case, the dressing case, and the night chair, in combination with the seat, A, constructed and operating substantially as and for the purposes described.

Second, The box holder, c', in combination with an ottoman, chair, stool, or other similar article arranged as a blacking case, substantially in the manner set forth.

Third, The sponge cup, e, in combination with an ottoman, chair, stool, or other similar article arranged as a blacking case, substantially in the manner described.

Fourth, The adjustable foot jack, J, or J', in combination with an ottoman, chair, stool, or other similar article, arranged as a blacking case, substantially as and for the purpose set forth.

**56,536.—SIGNAL TOWER.—Jason Dow, Biddeford, Me.**

I claim a signal tower, constructed and operated in the manner substantially as shown and described, and for the purpose set forth.

**56,537.—HITCHING STRAP.—John Dubree, Drummore Township, Pa.**

I claim the simple strap, G, for the attachment of the hitching

strap, F, when said strap, G, is connected with the bridle and bit, in the manner and for the purpose specified.

**56,538.—WAGON JACK.—Albert Dunn, Plainfield, N. J.**

I claim the combination of the bars or frames, A and B, or their equivalents, and handle lever, D, when constructed, arranged, and connected together, so as to operate substantially in the manner described, and for the purpose specified.

**56,539.—HARDENING IRON.—William C. Dunn, La Porte, Ind.**

I claim the process, herein described, of treating or hardening the cast-iron parts of plows, cultivator shares, and similar articles. I also claim as a new article of manufacture, plow mold boards, land sides, or shares, when made of cast iron, treated in the manner herein described.

**56,540.—COMBINED CHAIR AND DESK.—William A. Ehman, Milwaukee, Wis.**

I claim the combination of the chair seat, A, back, E, having eyes, K, side arms, D, having eyes, J, uprights or supports, c, and hook arms, H, or their equivalents, when all connected and arranged, so as to allow the back to be swung down into a horizontal position, or nearly so, and there supported, substantially as and for the purposes described.

**56,541.—GRAPE TRELLIS.—B. F. Elliott, Cedar Rapids, Iowa.**

I claim the side frame, C, and upper frames, D, in combination with the cross bars, E, or any other suitable fastening device for holding the said upper frame, D, in a horizontal position, or nearly so, when attached or connected together, and to any suitable bed frame or supports of the ground, substantially as and for the purpose described.

**56,542.—INSULATOR FOR TELEGRAPHS.—A. B. Ely, Boston, Mass.**

First, I claim a flanged disk on the insulating hook, when constructed and arranged in reference to the hole in the bracket, substantially in the manner and for the purpose set forth.

Second, The combination of the bracket and hole with the pin hook and disk, and arranged with or without flanges, substantially in the manner and for the purpose set forth.

**56,543.—HAND LANTERN.—Charles Engelskirchen, Buffalo, N. Y.**

I claim connecting the chimney cap, C, the glass or globe part, B, and the metallic base, A, together, by means of the skeleton frame, D E F, the said skeleton frame being so constructed and connected with the said parts, that the vertical wires, D, shall be permanently attached to the chimney cap, and the metallic base, A, shall be fastened to the glass or globe part by means of the spring band or clasp, F, and released therefrom, when the said spring band is unhooked, and the glass or globe part be retained within the skeleton frame, when the metallic base, A, is removed, substantially as described.

**56,544.—KNITTING-MACHINE NEEDLE.—Levi W. Field, Holderness, N. H. Antedated July 13, 1866.**

I claim the needle as made of the slotted shank, A, and the hooked lever, B, constructed, arranged, and applied together, substantially in manner and so as to operate as described.

**56,545.—REAPING MACHINE.—Henry Fisher and Milton Ball, Canton Ohio.**

First, We claim the combination of the slotted arm, F', attached to the hinged wing board, C, for the purpose of adjusting the rod, D, vertically and horizontally, substantially as and for the purpose set forth.

Second, We claim in combination with an overhung rod and cutter bar, B, the hinged board, C, and rod, D, attached at the main frame end only to an oscillating arm, F, substantially in the manner and for the purpose set forth.

**56,546.—INSTRUMENT FOR MEASURING TIRES FOR WHEELS.—Junius Foster, Long Branch, N. J.**

I claim the guide, h, fitted as specified, in combination with the measuring wheel, b, for the purposes and as set forth.

**56,547.—SCALE FOR WEIGHING ICE.—Talbot T Fowler, Washington, D. C.**

I claim the links, I m and n, when connecting the bar, F, the scale beam, B, and weigh beam, E, arranged substantially as and for the purposes specified.

**56,548.—PLANING MACHINE.—Joel Garfield, Groton Mass.**

First, I claim the combination of the feed and guide rolls, c c, with the gears, d and d', constructed and operating substantially as specified for the purposes set forth.

Second, The combination of the frame, J K, with the slides m, m, the shafts L and F, constructed substantially as described for the purposes set forth.

Third, The combination of levers, o and N N, with springs, S S, and the shaft, Q, operating substantially as described for the purpose set forth.

**56,549.—APPARATUS FOR TREATING ORES WITH CHLORINE.—Eugene Gaussoin, Baltimore, Md.**

First, I claim the inclosing walls and floor, forming chambers in which the barrels revolve, and from which the fluid contents are removed by drains from the sides, and the solid by an aperture at corner of the arch.

Second, The combination of the hollow axle and perforated walls, forming a series of connections from the generator, from barrel to barrel, and ultimately the discharge apertures at the summit.

Third, The arrangement of the barrels with their operating gearing, so that their respective openings are in revolution presented alternately to the openings of the ones next in series above, and next below, to afford the means of discharging as described.

Fourth, The combination of the revolving barrels, and the openings, J, and wall openings, H, as and for the purpose described.

Fifth, The combination of the valve, K, with the drains, Y Y W, as and for the purpose described.

**56,550.—FARM GATES.—Francis Gay, Bedford, Ohio.**

I claim the standard, D, the pedestal, E, and the pin or stem, F, as arranged and in combination with the gate, A, in the manner and for the purpose herein set forth.

**56,551.—BEE-HIVE.—Samuel Graffham, Lawrenceville, Ill.**

First, I claim a bee-hive which combines in its construction the following elements, viz., a pit, N, and sloping shelves N', a case, A, separated from the pit by a grated bottom, M, and having a porch, A, closed by a sliding door, D, and a cover, E, with caps, F F', and a drawer, L, located above the porch, the several parts being constructed and the whole arranged for use substantially as set forth.

Second, I claim the wedge formed stopper, K, when used for closing the slats in the front of the case after the removal of the slide, I, substantially as set forth.

**56,552.—REVERBERATING AND OTHER DRAUGHT FURNACES.—John R. Groat, Detroit, Mich.**

First, I claim in a reverberating or other draught furnace so arranging the atmospheric passage ways, a a' a'', and b b' b'', in the bridge, wall, and arch of the furnace, that the air passing in their currents, shall be heated by contact with the walls, and introduced from above and below into the compartment, D, in converging currents of the full width of the throat, C, when mingling with the unconsumed carbonized gases from the fuel in the fire room, B, their complete combustion and perfect diffusion will be effected, substantially in the manner set forth.

Second, I claim the combination of the plate, f, valve, g, rod, h, and lever, i, in the lower air passage, and the similar combination in the upper air passage or their equivalents for the regulation of the passage of air through the atmospheric passage ways, a and b, substantially as and for the purpose set forth.

Third, I claim constructing the bridge, C, across the lower atmospheric passage way for the protection of the valve, substantially as set forth.

# 56,553.—WATER ELEVATOR FOR WELLS.—Christopher Gullmann, Poughkeepsie, N. Y.

First, I claim the mouth, I, on the hollow shaft, I, arranged relatively to the bucket and to the rope, or its equivalent, and to the loose sleeve, G, connected by a clutch to the shaft, D, so as to perform the double function of retarding the descent of the bucket and ventilating the well, substantially in the manner herein specified.

Second, I claim the oscillating part, K, so mounted and arranged relatively to the bucket, and its connection liberated for descent, as described, that it shall retard the descent of the latter, in the manner herein specified.

Third, I claim the well bucket arranged to descend automatically, the revolving mouth, I, and the oscillating part, K, and the several connecting members of the mechanism, combined and arranged to effect the retardation of the descent of the bucket and the ventilation of the well, substantially as herein specified.

# 56,554.—CHAIR.—John Habermehl, Wheeling, West Va.

I claim the combination of the seat, metallic loops, and cross-piece of the rear legs constructed as described.

Second, Combination of loops, C, and rod, A, in a chair constructed to turn as described.

Third, Combination of spring, E, and rod, A, in a chair constructed as described.

# 56,555.—HORSE HOE.—Daniel Harris, Canaan, Me.

I claim the share, C, constructed or formed with sides, a, a, inclined both transversely and longitudinally, and also formed with a central longitudinally inclined surface, b, having a horizontal position in its transverse section, in combination with the adjustable mold boards, E, pivoted to the rear of the share, C, and retained in position by the clamp, F, and bars, e, e, all arranged substantially in the manner and for the purpose set forth.

# 56,556.—PUMP.—E. B. Harris, Wilmington, Ill.

I claim the arrangement of the well, A, cylinders, C, C, valves, D, vertical rods, E, E, disks, F, F, valves, G, G, partitions, H, H, valves, I, I, and trough, J, operating in the manner and for the purpose herein specified.

# 56,557.—RATION FEED BOX.—James Hayden, Exeter, Wis.

First, I claim the ration box when constructed, arranged, and used in connection with the feed box, A, substantially as herein specified, and described.

Second, The gate or slide, E, when constructed and used substantially as and for the purpose set forth.

Third, The measure box, S, and slides, when constructed, arranged, and used in connection with the ration box and reservoir box, substantially in the manner and for the purpose described.

Fourth, The reservoir box, X, when used in connection with the measure box, substantially in the manner and for the purpose set forth.

Fifth, The rod and nut used in connection with the gate or slide, E, when the whole are constructed, arranged, and used substantially as and for the purposes set forth.

Sixth, The opening, N, connecting the feed box, A, with the ration box, B, when combined, arranged, and used in connection with the gate or slide, E, substantially as and for the purpose set forth. Said ration feed box may be made double for two or more horses or other animals, as shown, or single for one horse or other animal; the several parts of the single or double ration feed box, as a whole, being substantially the same.

# 56,558.—SAND BELLOWS.—John W. Hendley, Washington, D. C.

First, I claim the arrangement of the sand box above the bellows so that it may be operated by the movement of the upper board or plate of the bellows, substantially as herein recited.

Second, I claim the connecting of the box to the pipes, and the nozzle to the sand and air pipes, by the elastic pipes, constructed and operated substantially as set forth.

Third, In combination with the nozzle and the conducting pipe, I claim the lever, J, constructed and arranged so that the parts may be operated as described.

# 56,559.—GUN SWAB.—P. M. Hendrick, and John J. Chattaway, Springfield, Mass.

First, We claim the use of a swab of rubber, or other similar elastic material, when the same is expanded laterally by vertical compression within the barrel for the purpose of cleaning the same, substantially as herein set forth.

Second, The combination of the springs, b b, with the other parts of the device for the purpose of holding the swab in place when compressed and expanded, substantially as herein described.

# 56,560.—WATER WHEEL.—R. S. Holeton, Niles, O.

I claim the arrangement of the penstock, G, within the flume, C, and the wheel within the said penstock, in combination with the cap, A, side openings, e, e, gate, G', below the wheels, lever, a, and rod, b, in the manner and for the purpose set forth.

# 56,561.—MACHINE FOR MAKING METAL TUBES.—Horace Hotchkiss, Plainfield, N. Y.

First, I claim in machines for bending plates of metal into convex or tubular forms, the combination of the guide spindle, M, constructed as described, with a system of guides of suitable form for the different stages of the work, and a system of rolls, or their equivalents, between which the work is formed into the required shape, substantially as described.

Second, I also claim the guide spindle, M, constructed and applied substantially as and for the purpose described.

Third, I also claim the rolls, N, O, constructed and operating in the combination shown, substantially as described.

# 56,562.—TRUSS.—T. L. Hough, Philadelphia, Pa.

I claim the arm, C, pivoted upon the journal, c, having the spring, a, attached thereto with its free end operating against the plate, n, substantially as shown and described.

# 56,563.—PAVEMENT.—D. Huestis, Cold Spring, N. Y.

I claim the grooved street pavement herein described, the same consisting of the boxes, A, with the bottom flanges, c, and dovetail spaces, d, with suitable filling, the upper edges being beveled and forming grooves when the boxes are combined and give hold to the feet of the animals, and adapted for a railway track, as specified and shown.

# 56,564.—KNIFE SCOURER.—H. B. Hutchins and Washington Horter, Philadelphia, Pa.

We claim as an improved article of manufacture, the knife and fork cleaner or scourer, described as set forth.

# 56,565.—LAST.—S. T. Hutchins, North Anson, Me.

I claim the self-operating spring clasp, d, and projection, e, combined and operating together to hold and to release the last block, substantially as described.

# 56,566.—STOVEPIPE DAMPER.—J. A. Jacobs, Pittsfield, N. H.

I claim a heat regulator composed of two grates, A, B, which are connected by sliding and revolving crank shaft, C, substantially as and for the purpose described.

# 56,567.—LANTERN.—E. N. Jenkins, Chicago, Ill.

First, I claim the band, D, provided with a plate or disk, E, for supporting a lantern globe, substantially as set forth.

Second, I claim the combination of the band, D, disk, E, and springs, a, or ledges, c, with the base, C, substantially as and for the purposes specified.

# 56,568.—WATER DRAWER.—M. W. Jenks, Richmond, Ind.

I claim the arrangement of the several parts in combination, as hereinbefore specified and set forth.

# 56,569.—HAT RACK.—C. H. Keener, Baltimore, Md.

I claim the hat rack, consisting of the ring, A, with loop, a, hanging in eye, b, substantially as described, for the purpose specified.

# 56,570.—BED BOTTOM.—C. A. Kellogg, Elyria, Ohio.

I claim the staple, D, pin, E, and belt or strap, F, in combination with the grips, G, and slat, B, as and for the purpose substantially as set forth.

# 56,571.—TURN-TABLE.—J. B. Kelly, Kendallville, Ind.

First, I claim the yoking ring, G, in combination with conical rollers and a concentric rail, or rails, substantially as and for the purpose herein described.

Second, The conical flanged wheels and beveled rails, in combination with the central ring, G, fixed center post, E', and a turning table, E, substantially as described.

# 56,572.—WATER WHEEL.—T. J. Kindleberger, Eaton, Ohio.

First, I claim the circular bar, d', connecting links, e and f, gates, a' and b', and guide boxes, d'', combined and arranged as above described and for the purpose set forth.

Second, The worm, w, rack, x, arms, u, valve, r, with disk, t, combined and operating as above shown and for the purpose set forth.

Third, The main driving wheel, C, auxiliary wheel, D, both upon main driving shaft, B, in combination with shoots, d and b, and gates, a' and b', for the purpose above specified.

# 56,573.—ROBE.—Julius Klamke, New York City.

I claim a traveling or other robe, of fur or other material, having pockets or receptacles for the hands and feet, or either, as herein described and represented, so that it may be used as a garment without interfering with any or all of its uses as a robe, as set forth.

# 56,574.—RENOVATING FADED FABRICS.—Rudolph H. Klauder, Philadelphia, Pa.

I claim the herein set forth combination of the processes of dyeing and opaque printing as a new and improved method of renovating worn or faded woven fabrics, whereby the described improved effects are produced, as and for the purpose specified.

# 56,575.—WATCH AND LOCKET CASE.—J. G. Konvalinka, Astoria, N. Y.

I claim, First, The movable head, C, fitted or mounted on a fixed pin, A, substantially as and for the purpose specified.

Second, I also claim the spring, D, in combination with the movable head, C, and fixed pin, A, and operating substantially as and for the purpose above specified.

Third, I also claim the catch, G, when it is movable, i. e., sliding up and down and operating substantially as and for the purpose above specified.

Fourth, I also claim the spring, M, bent externally over the cap, H, and operating substantially as and for the purpose above specified.

Fifth, I also claim the bridge, O, fastened externally upon the cap, H, substantially as and for the purpose above specified.

# 56,576.—METHOD OF PREVENTING SEALING-WAX FROM ADHERING TO MOLDS.—Noah W. Kummer, Dayton, O.

I claim the application of quicksilver in the manner and for the purposes herein respectively set forth.

# 56,577.—ROCK-DRILLING MACHINE.—Perley H. Lawrence, Springfield, Mass.

I claim, First, Attaching to the lower end of a drill-pipe a weight or sinker, when the same is arranged in the manner and operated as and for the purpose herein described.

Second, Placing the spring, A, of rubber or its equivalent, between the pipe, X, and sinker, B, when the same is arranged substantially in the manner and for the purposes herein set forth.

Third, Connecting the parts of the sinker, B, by means of the joint, C, D, substantially as herein described.

Fourth, Attaching the piston, G, to the frame of the machine, L, by means of the rod, H, pin, K, and collar, J, and using it in combination with the pipe, X, in the manner and for the purpose set forth.

# 56,578.—CIGAR PRESS.—Martin Leippe, Lancaster, Pa. Antedated Feb. 23, 1866.

I claim the form boards 1, 11, 111, 1111, constructed and employed substantially in the manner shown and for the purpose specified.

# 56,579.—PORCELAIN PICTURE FRAME.—C. L. Lochman, Carlisle, Pa.

I claim, First, The combination of the slotted lid, B, with the movable bars, G, G, mounted with leather, gum or other elastic cushion to grasp the two opposite edges of the porcelain plate, in the manner shown and described and for the purpose set forth.

Second, The combination of the frame, B, negative holder, F, F, spring, a, and hinged lid, B, with its movable bars, G, G, and springs, e, e, arranged, constructed, and operating in the manner substantially as shown and described.

Third, The movable bars, G, G, with their accompanying screws and burrs moving in slots as represented, or their equivalents.

Fourth, A movable negative holder, F, F, with spring, a, and fastening screw, E.

# 56,580.—GRAIN BINDER.—S. D. Locke, Janesville, Wis.

I claim, First, A binding machine operated by hand or by power taken from a harvester, provided with a cam cylinder, B, and the cam slides, K, operating sets of arms, as M, N, B, alternately, and a sheaf-discharging arm, F', combined with a disengaging coupling, C, and a self-acting disengaging arm, E, foot lever, I, binding arms, T, U, and the friction reel, A', when arranged and used in the manner and for the purposes herein set forth and described.

Second, Disengaging couplings of grain-binding machines by means of the disengaging arm, E, when constructed with or without the shaft spring, E, as set forth herein and described.

Third, The cam cylinder, B, when constructed substantially as described, and used to operate the working parts of a grain-binding machine, substantially in the manner as herein set forth and described.

Fourth, The cam slides, K, when constructed substantially as described, with or without the friction roll, and used to communicate motion to the working parts of a grain-binding machine, substantially as herein described.

Fifth, The foot lever, I, or equivalent device, used to raise or remove the disengaging arm of a grain-binding machine, so as to allow the couplings to be engaged, as herein described and set forth.

Sixth, I claim the combination of a back-acting disengaging coupling, with a shaft-spring and the disengaging arm, E, the combination operating so as to allow a backward motion to the harvester without affecting the process of binding or operating the parts of a binding machine, substantially as set forth.

Seventh, I claim the combination of the back-acting disengaging coupling and shaft spring, with a disengaging arm and a disengaging lever, substantially as set forth.

Eighth, I claim the combination of a revolving cam cylinder and its moving mechanism with the vibrating arm, R, for operating a twisting or tying device, the parts being constructed and operated substantially as herein set forth.

Ninth, I claim the combination of a revolving cam cylinder with vibrating binding arms, and a vibrating arm operating a twisting or tying device, arranged and operating as described, whereby the binding arms and the twisting or tying arm are worked alternately, substantially as set forth.

# 56,581.—QUARTZ CRUSHER.—John Mabbs, Isle Royal Mines, Mich.

I claim, First, The feed-table, J, mounted in the tubular shaft H, in combination with the mullers, F, and main shaft, B, constructed and operating substantially as and for the purposes described.

Second, The plow, L, in combination with the feed-table, J, tubular shaft, H, and horizontal shaft, E, constructed and operating substantially as and for the purposes set forth.

Third, The tank, O, in combination with the plow, L, feed-table, J, and mullers, F, constructed and operating substantially as and for the purposes described.

# 56,582.—TWEED.—James F. Maguire, East Boston, Mass.

I claim a tweed, constructed substantially as described, and for the purpose set forth.

# 56,583.—THRASHING AND HULLING CLOVER.—M. H. Mansfield, Ashland, O.

First, I claim, in a thrashing or clover hulling and thrashing machine, which employs a fan, G, for blowing or blowing away chaff, dust, and other foreign substances, the construction and arrangement of the dust chambers, b, situated within the frame of the machine, apertures, b, fan, b2, and discharge passage at a', all substantially as and for the purpose described.

Second, The construction of the shoe, E, with the imperforated boards, e' e', said boards being arranged as described and shown for the purpose set forth.

# 56,584.—PLOW.—Hubbard Martin, Jeffersonville, Ind.

First, I claim the wrought iron angle beam, A, connected to the mold board, a, by the angle bar, D, and the rod, E, all constructed and arranged substantially as and for the purpose set forth.

Second, The clevis, H, provided with an upper elastic plate, e, in combination with the notched plate, g, attached to the beam, substantially as and for the purpose specified.

Third, The wrought iron handles, B, B', in combination with the angle beam, A, substantially as and for the purpose set forth.

# 56,585.—EVAPORATOR.—Silas B. Maulsby, Muncie, Ind.

I claim, First, The graduating self-straining step pan, I, constructed substantially as herein described, in combination with the furnace, for the purposes set forth.

Second, The revolving finishing pans, N, supported by and revolving upon cranes, substantially as herein described, in combination with the step pan, I, and with the furnace, for the purposes set forth.

# 56,586.—WAGON HUB.—W. McClelland, Springfield, Ill.

I claim, First, Constructing the hubs of vehicles of wood for receiving the tenons of the spokes, and encasing the same by metallic disks, substantially in the manner and for the purpose set forth.

Second, In combination with the disks, C and C', I claim the pipe boxing, D, arranged substantially as and for the purpose set forth.

Third, In combination with the spindle E, flange, C2, and pipe boxing, D, I claim the cap, I, substantially as set forth.

Fourth, In combination with the wooden hub, A, and metallic disks, C and C', I claim the bolts, H, or their equivalent, substantially as and for the purposes set forth.

# 56,587.—METALLIC PAPER FASTENER.—George W. McGill, Washington, D. C.

I claim the within described paper fastener, formed of a single piece or strip of metal bent in a T-shape, the ends of the strip being in close contact, and pointed so as to make only a single hole in the paper, which it is designed to connect, the two ends opening from each other after passing through the papers, and confining said papers between said ends and the arms of the T, substantially as set forth.

# 56,588.—PRESS.—James A. McGillivray, Dyer, Ind.

I claim, First, The connecting rim, I, of the wheel, P, with the shaft, Q, of the windlass, by means of the metal spider, R, in combination with the loose drum, V, on shaft, Q, and the slide, V, or an equivalent fastening, to engage with the arms, J, of the spider, substantially as set forth.

Second, The attaching of metal rim, h, to the flange, g, of the wheel, P, in combination with the slide, O, substantially as and for the purpose specified.

Third, The bar, S, attached to the rim, I, of wheel, P, by a joint, I, in combination with the cleats, m, m, on the said rim, the slide, O, and the inclined curved bar, T, attached to the framing of the windlass, substantially as and for the purpose set forth.

# 56,589.—HARVESTER CUTTER SHARPENER.—J. McKnight, Pomeroy, Ohio.

I claim the right-angular arms, C, D, in combination with the rod, B, handle, A, nut, b, head, a, constructed and arranged in the manner and for the purpose herein specified.

# 56,590.—BUCKLE.—John McClellan, Chambersburg, Pa.

I claim the plate, A, with its guard, B and C, in combination with the sliding catch, F, the whole being constructed and arranged for the reception and retention of straps, x, y, substantially as described.

# 56,591.—CLOTHES WRINGER.—Wm. T. McMillen, Cincinnati, Ohio, and Edward P. Conrick, Delavan, Wis.

We claim the counter shaft, F, having pinions, E, E', at both ends, in the described combination with the pair of doubly-gear wringer rolls, A, C, C' and D, D', for the purpose explained.

# 56,592.—SASH FASTENER.—W. M. Merriell, Jefferson, Ind.

I claim the application of a spring, F, of suitable construction, in combination with the screw-bolt, G, to the cog wheel, D, whereby the window is prevented from moving unless force, other than its own gravity, is exerted upon it, substantially as specified.

# 56,593.—PRINTING ON BOTTLES.—Isaac L. Miles, Charlestown, Mass.

I claim the within described apparatus, consisting of the adjustable bed, C, with its elastic type block, D, ways, M, and gauge, I, operating substantially as and for the purpose set forth.

# 56,594.—RAILROAD CARS.—Ezra Miller, Brooklyn, N. Y.

First, I claim constructing the platform of railroad cars, in a horizontal plane with the car beds, and sustaining such platforms by means of trussed rods, substantially in the manner described.

Second, The cross timbers, a, a', applied to the two intermediate longitudinal platform beams, C, C', substantially as and for the purpose described.

Third, The construction of spring buffers and couplings, substantially as herein described, to produce compression between cars which are coupled together, so that the spring buffers and couplings shall constantly act together to prevent shocks and jerks in starting, stopping or running trains, said buffers and couplings being arranged substantially as set forth.

Fourth, Constructing the hooks, D, partly of cast metal and partly of wrought metal, substantially as described.

Fifth, Chilling the abutting faces of the coupling hooks, D, substantially for the purpose described.

Sixth, Facing the abutting surfaces of the buffer heads with a metal which is harder than that of which the heads are formed, substantially as described.

# 56,595.—MODE OF GRANULATING FURNACE SLAG.—Charles E. Morris and John Eymon, Bridgeport, Pa.

We claim granulating furnace slag, by running it in its hot, fluid condition, from the furnace, directly into any suitable receiver containing cold water, substantially in the manner described.

# 56,596.—EXTRACTING SPECIMENS OF LIQUORS.—Joseph M. Naglee, Philadelphia, Pa.

I claim the combination of the reservoir tube, A, and its valve, t, with the elastic air vessel, C, and its valves, e, e', the whole being constructed and operating substantially as and for the purpose described.

# 56,597.—SIPHON.—Joseph M. Naglee, Philadelphia, Pa.

I claim, First, The elastic air vessel, c, and valve, e, e', combined with a siphon, substantially as and for the purposes described.

Second, The combination of the adjustable rod, g, with the short arm of a siphon, substantially as set forth for the purpose specified.

# 56,598.—WIND WHEEL.—C. Nickerson, Chenoa, Ill.

I claim a wind wheel composed of two series or sets of fixed wings or sails, C, C', secured between heads, B, B, one set for series projecting out from the heads further than the other set or series, and placed alternately in position, substantially as shown and described.

# 56,599.—DIE FOR MAKING EYEBOLTS FOR VESSELS.—Charles Norton, New Haven, Conn.

I claim the combination of the lower die, A, B and C, with the upper die, A' B' and C', when constructed, arranged and fitted for making eyebolts, substantially as herein described.

# 56,600.—HAND SPINNING MACHINE.—Thomas G. Odell and Boyd Glover, Camp Point, Ill.

We claim, First, The arrangement of the frame, D, made as described, the cog wheel, C, pinion, B, band pulley, A, and spindle,

die, F, the whole forming a portable spinning machine for domestic use, substantially as above set forth.

Second, In combination with the above, we also claim the adjustable plate, G, for holding the spindle, made and applied to the frame, D, as described.

**56,601.—ANTI-FRICTION CARRIAGE AXLES.**—Edmund C. Ode, Voluntown, Conn.

I claim the combination of the two rolls, B, B, fixed to the axle, A, so as to operate within the hub, D, substantially as and for the purpose specified.

**56,602.—DIE FOR FORMING HEADS OF WRENCHES.**—Henry W. Pell, Rome, N. Y.

I claim the improvement in the manufacture of wrenches herein described, the same consisting in subjecting the bar of iron from which the wrench is to be made to the action of the consecutive set of dies, substantially as described, and in the manner and for the purpose set forth.

**56,603.—INKSTAND AND CALENDAR COMBINED.**—Geo. G. Percival, M. D., Brooklyn, N. Y. Antedated July 19, 1866.

I claim the calendar constructed and arranged as herein specified in the described combination with the inkstand, A.

**56,604.—HAND LANTERN.**—George Peugeot, Buffalo, N. Y.

I claim the manner of attaching the glass globe to the wire frame by means of the vertical wires, B, C, hooking on to the knobs, G, G, or into or under the bottom of the glass as shown at L, M, substantially as described.

**56,605.—FLOUR PACKER.**—Oscar Place, Brooklyn, N. Y.

I claim the arrangement of the perforated sliding plates, R, S, provided with lever, T, having adjustable bearing, V, perforated plates, M, N, H, in combination with the sliding tubes, K, applied with the movable frame, G, and sliding frame, L, operating in the manner substantially as described and for the purpose set forth.

**56,606.—SHACKLE FOR CARRIAGE TONGUES.**—F. R. Pollard, Canaan, N. H.

I claim a pivoted catch combined with the end of a carriage tongue, substantially in the manner and for the purpose herein set forth.

**56,607.—COLLAR FOR DRILL RODS.**—W. T. Priest, Decatur, Ill.

First, I claim the combination of the section, A, and grooved bed section, A, connected by a screw joint, with the inclined or milled key, I, and key seat, C, the adjustable band, F, and groove, H, substantially as described.

Second, I also claim the grooves, D, and recesses, E, in the upper section or rod, A, in combination with the band, F, having internal pins, G, substantially as described.

**56,608.—MAKING BRICK.**—Thomas C. Prosser, Bay City, Mich.

I claim the forming of the materials in which hydraulic lime is one of them proportioned or varied as above into separate and individual bricks as described, to be used for and applied to the purposes hereinbefore set forth.

**56,609.—BOILER FOR CULINARY PURPOSES.**—T. T. Prosser, Chicago, Ill.

First, I claim the shallow chamber, C, below and connected with the inner and main chamber, E, by the opening, a, and with the upper and exterior reservoir, B, substantially as and for the purpose set forth.

Second, The combination and arrangement of the chambers and movable cover, for the purposes hereinbefore set forth.

**56,610.—SHIRT COLLAR ATTACHMENT.**—James Proud, New York City.

I claim the plate, C, having opening, D, E, and hooks, F, made as described for the purpose specified.

**56,611.—MODE OF MANUFACTURING HARNESS NAILS.**—Frederick Reynolds, Newark, N. J.

I claim an improved mode of forming and plating the soft metal heads of harness nails, substantially as herein described.

**56,612.—SEWING BUTTONS TO GARMENTS.**—J. W. Roberts, New Monmouth, N. J.

I claim the spring staple, B, with barbed ends, b, b, in combination with the slotted button back or the washer, E, operating substantially as described.

I also claim in combination with the barbed staple and elastic washer, D, applied substantially in the manner and for the purpose set forth.

**56,613.—GANG PLOWS.**—William T. Rogers, Quincy, Ill.

I claim, First, The manner as hereinbefore set forth, of securing gang plows or cultivator beams upon a carriage that can be used to support either or both by means of the hangers, F, guide, F, and braces, ff, or their equivalents in combination with the rods, E, E, arranged and operating substantially as and for the purpose described.

Second, I claim the seat bars, B, with their clevises, L, or an equivalent in combination with the manner as hereinbefore set forth, of regulating the seat to suit the inclination of the bars by means of the rocker, M, and adjusting standard m, with supporting and locking pins, or their equivalents.

**56,614.—CROSS HEAD FOR BLOWERS.**—P. H. Roots, and F. M. Roots, Connersville, Ind.

I claim a piston constructed of cross head, A, fastened to a shaft, B, in combination with wooden lugs or strips, C, which are secured to the cross heads, substantially as and for the purpose set forth.

**56,615.—KNIFE AND SCISSORS SHARPENER.**—James J. Russ, Worcester, Mass.

I claim the combination of the stand or holder, A, having inclined slots, E, and the sharpener plates, B, when arranged and connected together, substantially as and for the purpose described.

I also claim the stand or holder, A, slotted in an angular direction and notched at F, in combination with the sharpener plate, B, the whole together forming a combined knife and scissors sharpener, substantially as and for the purpose described.

**56,616.—PADLOCK.**—Cyrus W. Saladee, Newark, Ohio.

I claim, First, The shield plate, A, with key slot, D, in combination with the lock plate, B, and spring, J, constructed and operating as described and for the purposes set forth.

Second, I claim the stud, F, and spring, J, as arranged in combination with the lock plate, B, and slot, d', and hasp, C, and covers S, of the key hole, operating as described and for the purpose set forth.

Third, I claim arranging the wards 9 and 10, on the shield plate, A, for the purposes set forth and operating as specified.

Fourth, I claim the key constructed with hook, I, as described, in combination with key slot, D, and lock plate, B, and spring, J, constructed and operating as set forth.

Fifth, I claim the stud, F, or its equivalent, in combination with the lock plate, B, and spring, J, in the manner and for the purpose substantially as shown and described.

**56,617.—PADLOCK.**—Cyrus W. Saladee, Newark, Ohio.

I claim the shield plate, N, provided with the guard ring, C, and otherwise constructed in the manner and for the purpose substantially as shown and described.

**56,618.—FINGER, SCARF AND NAPKIN RINGS.**—L. Sauter, Jersey City, N. J.

I claim the annular sliding band, C, furnished with opening, f', and applied in combination with the hollow body, a, b, furnished at its outer circumference with openings, C', substantially as herein set forth for the purpose specified.

**56,619.—OVER-CHECK DRIVING REIN.**—L. G. Sayre, Cincinnati, Ohio.

I claim the provision in connection with a bit, A, and bridle of the ordinary form, of the independent upward bearing bit, F, suspended from the over-check, G, in the described combination with the check or safety rein, I, substantially as set forth.

**56,620.—METHOD OF PACKING NITROLEUM AND NITRO-GLYCERIN.**—Taliaferro P. Shaffner, Louisville, Ky.

I claim, First, The placing between a bottle containing nitro-leum, nitro-glycerin or other liquid combustible compound and an outer casing or box, india-rubber or caoutchouc or other material to serve as springs for the purpose of lessening concussion upon the said liquid substance by an exterior force resulting from a pull or otherwise, substantially as hereinbefore described.

Second, I claim the application of plaster of paris powder or of other equivalent non-conductor of heat and non-explosive or combustible substance when saturated with the liquids hereinbefore mentioned, in combination with the arrangements or parts, substantially as hereinbefore described.

Third, I claim the use of metallic bottles for the purpose of confining the nitro-leum, nitro-glycerin or other explosive liquid, in combination with the arrangements and parts, substantially as hereinbefore described.

**56,621.—HAME FASTENER.**—M. R. Sholters, Alliance, Ohio.

First, I claim the loop, B, provided with lips and slots, the hooks, A, pivoted to the arms, a, a, arranged and operating conjointly, as and for the purpose substantially set forth.

Second, I claim hook, A, finger, c, and thumb piece, F, in combination with the pin, D, arms, a, a, and loop, B, arranged as and for the purpose set forth.

**56,622.—DIES FOR MANUFACTURING TIN-LINED LEAD PIPES.**—W. Anthony Shaw, New York City.

I claim, First, Insuring a lining of tin of uniform thickness by providing an escape for the lead, either through the cylinder, die, or ram.

Second, I claim the die, A, in combination with the pipe, H, when the two are constructed and arranged in relation to each other, substantially as described.

**56,623.—DRIVING WELL TUBES.**—Calvin Shepard, Hatterville, N. Y.

I claim, First, The combination of the tube, A, constructed as described, with the flange, F, the collar, E, and platform, D, suspended therefrom, all arranged and operating in the manner and for the purpose herein specified and shown.

Second, I also claim the platform, D, supported on the flange, F, as shown in combination with the well tube, substantially as described.

**56,624.—MODE OF LUBRICATING JOURNAL BOXES.**—Albert R. Sherman, Natick, R. I.

I claim the caps, D, and scrapers, c, in combination with the shaft, C, and box, A, constructed and operating substantially as and for the purposes described.

**56,625.—WATER-PROOF FABRIC.**—John Snare, New York City.

I claim the water-proof or compound fabric adapted to the purposes specified, and formed of laminae of mica, cemented to flexible material, as specified.

**56,626.—PEAT MACHINE.**—M. B. Stafford, New York City.

I claim, First, The constructing of the molds, c, of two longitudinal parts or halves connected by hinges and so arranged as to form an endless chain of molds to work over rollers and receive the peat or other substance to be compressed and to discharge the same, after being compressed, by passing over the roller at the discharge, and of the framing, substantially as set forth.

Second, The plunger, F, operated as shown in combination with the endless chain of molds, substantially as and for the purpose specified.

Third, The hopper, M, provided with one or more partitions, l, provided with teeth, m, at their lower edges, in combination with the endless chain molds, C, substantially as and for the purpose set forth.

**56,627.—PUMP.**—Joseph A. Stansbury, Baldwinsville, N. Y.

I claim the combination of the right-angled wings, g, g, attached to and turning with the same shaft, and the guide, G, when said parts are used in connection with a pump, substantially as herein specified.

I also claim the buttment made up of the parts, m and n, in combination with the wings, g, g, operating substantially as herein set forth.

I also claim the spring, l, in combination with the wings, g, g, and guide, G, operating substantially as specified.

I also claim in combination with the wings, g, g, and the shaft, f, the hub, D, provided with the flange, d, substantially as described.

I also claim the arrangement as a whole, consisting of wings, g, g, guide, G, buttment, m, n, hub, D, and spring, l.

**56,628.—WRENCH.**—Robert S. Stenton, Brooklyn, N. Y.

I claim arranging the jaws upon a straight shank, whether the former be perpendicular or inclined to the latter, and operating the movable jaw by a screw supported at its lower end in a step formed in the solid metal of the shank, and with a rosette, or its equivalent, for turning the same located and contiguous to said step, all constructed substantially as set forth.

**56,629.—PROCESS OF BURNING GAS FOR THE PRODUCTION OF HEAT, LIGHT, ETC.**—Simon Stevens, New York City.

I claim the mixture of steam with coal gas or other gases produced by distillation of hydrocarbon substances, or their equivalents, so as to render it more useful for the production of heat and light, as herein described.

**56,630.—CURTAIN FIXTURE.**—J. Leverance Stewart and Samuel R. Pierce, Homer, N. Y. Antedated July 15, 1866.

We claim, First, The break block, G, constructed substantially as and for the purposes herein set forth.

Second, The combination of the roller, C, the break, E, the cord, L, with weight, H, attached, the several parts being arranged substantially as and for the purposes specified.

**56,631.—ADJUSTABLE PITMEN FOR PRESSES, PUNCHES, ETC.**—Norman C. Stiles, Meriden, Conn.

I claim the two unequally-spaced series of grooves, m, n, arranged to operate together by the aid of one or more keys, G, fitted into any desired pairs of grooves, so as to compel the same to coincide and to hold the parts very firmly with great nicety of adjustment, substantially in the manner and for the purpose herein set forth.

**56,632.—TABLE.**—Thomas B. Stout, Keyport, N. J.

I claim the supports, f, f, h, applied to the end leaves, and to the frame work, substantially as and for the purposes herein specified.

I also claim the combination of the supports, f, f, h, "governors," m, m, and slide bearings, g, g, l, substantially as and for the purpose herein set forth.

I also claim the combination and arrangement of the battens, C, C, coupling pins, c, c, and leaves, A, A, and D, D, substantially as and for the purpose set forth.

**56,633.—METHOD OF DESTROYING LICE ON TREES.**—M. O. Sullivan, Thompson Station, Ill.

I claim the ingredients herein described, when compounded substantially as and for the purpose set forth.

**56,634.—WATER ELEVATOR.**—L. Taylor, Jordan, Wis.

I claim, first, the arrangement and combination of the carriage,

N, carrying a water bucket, strands, K, receptacles, E, H, pipe, G, rope, J, and windlass, I, for elevating water to the upper apartments of a house, substantially as shown.

Second, I also claim the carriage, N, shown in figures 1, 2, and 4, having wheels, O, pulleys, O, an opening, c, to receive the head, R', of the float, and locking pins to lock the head when the carriage is drawn upward along the strands, K, substantially as described.

Third, I also claim the float, R, placed over the bucket, substantially as described, and having a head, R', with a pulley to allow it to be suspended by rope, J, as shown.

**56,635.—REDUCING OXIDE OF LEAD.**—Thomas Taylor, Washington, D. C.

I claim, first, The protoxide of lead as a flux in the reduction of lead dross, substantially for the purpose and in the manner herein set forth.

Second, The use of iron as a deoxidizer of the protoxide of lead, substantially for the purpose and in the manner herein set forth.

**56,636.—GOLD SEPARATOR.**—Charles F. Testman, Portland, Oregon.

I claim three things—the first is the process of drying dirt in the boxes, a and b, by means of the fire, c; the second is the application of the springs, o, o, to the roller, m, and the third is the method of constructing the amalgamating pans, r, r, and procuring thereof the gold dust in the quicksilver pockets by means of the continued revolution of the stirrer, q, q.

**56,637.—PUMP.**—Daniel M. Thomas, Dowagiac, Mich.

I claim, first, The arrangement of the plunger chamber, B, so as to communicate with the induction chamber, E, and its upper end, and the side passage, D, which leads to the receiving chamber, G, substantially as described.

Second, In combination with a force pump, which is constructed with upper and lower inflow chambers, leading to the main piston chambers, I claim the application of a safety valve, h, to the vertical discharge pipe, H, substantially as described.

Third, The vibrating frame, C, connected to the working beam, L, by means of flexible connections, I, I, in combination with the segments, J, J', and pendulum, J2, for operating the pump pistons, substantially as described.

**56,638.—TRACE BUCKLE.**—W. McK. Thornton, Clinton, Wis.

I claim the frame, A, constructed of two longitudinal bars, a, a, and two transverse bars, b', b', in combination with the pin, g, and spring tongue, C, all arranged in the manner substantially as described.

**56,639.—LOCK FOR RECEIVING THROTTLE VALVES.**—C. C. Torrence, Ripley, Ohio.

I claim the combination of the lock, D, slotted guard, C, and the valve lever, A, substantially as described.

**56,640.—BROOM HEAD.**—Harvey Trumbull, Central College, Ohio.

I claim the jaws, A and C, the screw b, the nut, d, and ferrule, E, the whole arranged and constructed in the manner and for the purpose substantially as herein described.

**56,641.—SEWING MACHINE.**—Joseph C. Tucker, San Francisco, Cal.

I claim, first, The combination of a rocking, perforating needle carrying arm, with one or more adjustable perforating needle carrying arms, substantially as described.

Second, The combination of the lower thread carrying looper, working in fixed bearings with one or more loopers, the bearings of which are capable of being adjusted substantially as and for the purpose set forth.

Third, The combination with the rocking arm of a sewing machine provided with a perforating needle of one or more adjustable needle carrying arms above the table, and a looper working in fixed bearings below the table, and one or more loopers in adjustable bearings for making parallel lines of stitching, substantially as described.

Fourth, In combination with the rocking arm of a sewing machine carrying a perforating needle, and provided with one or more adjustable needle carrying arms, I claim a stationary arm provided with one presser, held in fixed bearings, and one or more in adjustable bearings, substantially as described.

**56,642.—SASH FASTENER.**—F. B. Van Vleck and G. Nichols, Plainfield, N. J.

We claim the thumb piece, e, passing through a mortise in the plate, c, and connected to the bent lever, f, in combination with the lifter, d, bolt, g, and spring, k, the parts being arranged and acting as and for the purposes set forth.

**56,643.—BRAIDING MACHINE.**—Florence L. Veerkamp and Charles F. Leopold, Philadelphia, Pa.

We claim, first, In a braiding machine, two sets of spools, M and I, caused to traverse in contrary directions in concentric annular parts when the threads of the two sets of spools are made to cross each other and be plaited by the devices herein described or any equivalent to the same, for the purpose specified.

Second, The plate, F, with its radial recesses, y, in combination with the cam plate, P, and its wires or projections, u, the whole being constructed, arranged, and operating substantially as and for the purpose herein set forth.

Third, The combination substantially as described of the shuttle or spool carrier, A, and its guard rod, K, for the purpose specified.

**56,644.—WASHING MACHINE.**—F. W. Vosmer, Cincinnati, Ohio.

I claim, first, A batten consisting of the parts, J, N, O, P, P', in combination with the external lever, I, and connecting arm, M, all arranged and operating in the manner herein described and set forth.

Second, I claim the corrugated lid, D, hinged to a permanent support, E, G, and otherwise arranged substantially as herein set forth to adapt it for use as a washboard.

**56,645.—WRITING PEN.**—Samuel Warrington, Philadelphia, Pa.

I claim a pen, A, having curves, c and c, and flanges, x, x, when the said curves and flanges are formed and arranged in respect to the nib and shank of the pen, as and for the purpose described.

**56,646.—SEWING MACHINE.**—Albin Warth, Stapleton, N. Y.

I claim, first, The arrangement of a friction spring in combination with the vibrating needle arm, c, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement with said spring of a set screw or other equivalent fastening in combination with the vibrating needle arm, constructed and operating substantially as and for the purpose described.

Third, The arrangement of a lip, S, extending from the needle holder on the back of the needle, substantially as and for the purpose set forth.

Fourth, The guard, g, applied to the top edge of the bobbin holder, M, substantially as and for the purpose set forth.

Fifth, The friction brush, e', or its equivalent, in combination with the bobbin, K, and bobbin holder, M, constructed and operating substantially as and for the purpose described.

Sixth, In combination with a Wheeler & Wilson Sewing Machine, when such machine is so constructed that the needle is made to feed the material, I claim the devices herein shown or their equivalents for producing a chain stitch.

Seventh, The protector, n', in combination with the revolving hook, I, and chain stitch mechanism, constructed and operating substantially as and for the purpose set forth.

Eighth, The side surface cam, N, in combination with the chain stitch slide, h', spring, j', and stop lever, q', constructed and operating substantially as and for the purpose described.

**56,647.—LAMP SHADE.**—James H. Webber, Charlestown, Mass.

I claim in combination with the ring, a, and its fingers, b, the wings, d, provided with recesses, c, for holding the ring, f, substantially as set forth.

**56,648.—SHINGLE MACHINE.**—Harry White, Onondaga Castle, N. C.

I claim the combination and arrangement of the automatic feeding plate, V, the forked guide rod, c, with the adjusting rods,

R R, the whole being arranged for joint operation, substantially as described.

I also claim adjusting the knives to shave the shingles in the form described, by the means substantially as described.

**56,649.—STOVE.**—Thomas White, Quincy, Mass.

I claim the arrangement in a heating stove of the straight flues, E F G H and I, in combination with the exit aperture and pipe, C, substantially as and for the purpose above described.

**56,650.—SAFETY PAPER.**—James M. Wilcox, Glen Mills, Pa.

I claim paper having intermingled or united with the fibres of the sheet during the stage of the transformation from pulp to paper, or at any other time when such a thing can be done, of detached fibres or threads different from the ordinary fibres in such a way as to group or locate the introduced matter on any part or parts of the sheet while the remainder is left free or comparatively free from it, thereby forming one or more streaks or drops or clouds, or giving a general direction to said introduced fibres, or thereby producing any other distinctive mark or marks in the sheet or note.

**56,651.—CABINET MAKER'S SCRAPER.**—Frank A., John H. & Daniel G. Williams, Cincinnati, Ohio.

We claim a scraper consisting of the blade, A, stock, B b, mouth piece, C, set screw, D, and clamping screws, E E, all constructed and arranged substantially as and for the purpose herein specified.

**56,652.—POTATO WASHER.**—Joshua H. Williams, East Craftsbury, Vt.

I claim the combination of the grate, D, with the pall, A, revolving shaft, C, and sweep, E, constructed and arranged in the manner and for the purpose herein specified.

**56,653.—FASTENING FOR BOTTLES.**—Henry Wilson, Paterson, N. J. and James Wilson, New York City.

We claim the socket, a, in the bottle, A, in combination with the strap, B, substantially as and for the purpose described.

**56,654.—WATER WHEEL.**—John N. Wolfe, Lancaster, Ohio.

I claim, first, The buckets, B, constructed as herein set forth in combination with the openings, a, a, substantially as specified. Second, The combination of the gates, b b, constructed and operated as described with the chamber, C, and buckets, B, substantially as set forth.

**56,655.—COAL OIL BURNER.**—Twentyman Wood, Westport, Conn.

First, I claim giving to the upper section of the shell a combined vertical and lateral movement, substantially as shown for the purpose indicated.

Second, Combining with the upper and lower sections of the burner the parallel levers attached as shown, when the same shall be combined substantially as herein described and for the purposes specified.

**56,656.—PLANING MACHINE.**—James A. Woodbury, Boston, Mass.

I claim, first, So combining the yielding feed roll in a planing machine, with the weighted levers which control it, and when said roll is weighed and geared, so as to raise both ends of it at once, as that when the board runs out the weight of the levers shall be removed from said feed roll, and leave it simply suspended to or by the screws, so that it can be raised or lowered without raising or lowering the weight of the levers, and when constructed and operating substantially as described.

I also claim so combining and arranging the yielding feed roll of a planing machine with the gear for raising and lowering it, and when weighted as above claimed, as that while both ends of said roll will raise together by the gearing, yet neither end thereof can yield or rock in the line of its length, to conform to the varied thickness of the edges of the boards passed through under it, substantially as described and represented.

**56,657.—ROTARY VALVE.**—William E. Worthen, New York.

I claim a rotating steam valve provided with a cavity extending from the periphery to the face of the valve, as described, in combination with a seat, substantially as described, and proper appliances as specified for holding the valve in its seat.

I also claim a rotating valve provided with two cavities substantially as described in combination with proper appliances for holding the valve on its seat, a valve seat, and a clust provided with a steam passage, all substantially as described, and all operating in combination as set forth.

I further claim, in combination with a rotating valve and a steam passage, an adjustable cut off ring, the combination being substantially as specified and acting substantially as set forth.

**56,658.—PISTON ROD PACKING.**—Francis Wight, Galesburg, Ill.

I claim, first, The gasket, c, in combination with the bushing, b, sleeve, d, and steam chamber, e, constructed and operating substantially as and for the purpose described.

Second, The steam chamber, e, and channels, f, in combination with the packing rings, f, sleeve, d, and follower, g, constructed and operating substantially as and for the purpose described.

Third, The double inclined packing rings, f, as and for the purpose described.

**56,659.—GRINDING MILL.**—Charles D. Young and James McLean, Waterloo, N. Y.

We claim the blast tubes, E E, having their ends, b b, opening outward in opposite directions in the extremities of the furrows of the bedstone to distribute the blast properly employed in combination with an exhaust tube, H, connected with the same fan case, G, for the extraction of moisture, as herein set forth.

**56,660.—MARINE CAR.**—George H. Young, Charles-town, Mass.

I claim the articulated pontoons or floats arranged in the form of one or more endless aprons, and traveling over suitable drums, in combination with the car, A, constructed and operating substantially as and for the purpose described.

**56,661.—CHURN.**—John Young, Adrian, Ohio.

I claim the dasher, D, formed with the concentric channels, d d', and with perforations or apertures, G G, communicating with said channels in the manner and for the purposes explained.

**56,662.—SULKY PLOW.**—Peter Young, El Paso, Ill.

First, I claim the cords, j and l, sliding rod, k, lever, F, and yoke, m, all arranged and operating as and for the purpose set forth.

Second, In combination with the above, I also claim the steady lever, n, arranged and operating substantially as herein shown and described.

**56,663.—SCREW PLATE.**—Nicholas Zillier, New Castle, Del.

I claim an improved screw plate formed by combining with the two handled plate, A, the die holder, B, the dies, D, the spring, C, and the cap, E, the parts being constructed and arranged substantially as herein described and for the purpose set forth.

**56,664.—WHEAT DRILL.**—George Zorger, Greensburg, Ind.

I claim, first, The means employed for adjusting the arms, F F, to wit, the rods, G G, attached at their outer ends to the rear ends of the arms, F, and connected at their inner ends to opposite sides of a wheel, H, on a vertical shaft, I, which has an elastic handle or lever, J, attached to it, engaging with a notched semicircular bar, K, substantially as shown and described.

Second, The two wheels, B B, supporting the front end of the bar, A, in combination with the gearing, b c d E k k, all arranged as shown and described for rotating the screws, N N O, as set forth.

Third, The slotted plates, S, in the hoppers, P, provided with the slides, T, for the purpose of regulating the flow or discharge of the seed as described.

Fourth, The securing in proper position of the seed conveying spouts, Q Q R, to the arms, F F, and bar, A, by means of the slotted plates, U, substantially as shown and described.

**56,665.—LIQUID GLUE.**—C. F. Binder (assignor to himself and J. Binder), Philadelphia, Pa.

I claim a liquid glue produced in the manner and by the process substantially as herein described.

**56,666.—SNAP HOOK.**—Henry Bradbury, Berlin, Conn., assignor to Neal, Wilcox & Company, Southington, Conn.

I claim a snap hook formed with a transverse cylinder or opening containing the spring, in combination with the snap or latch, c, and its end plates or fork, e, enclosing the said transverse cylinder, and composing the spring joint of the snap, substantially as set forth.

**56,667.—CORN PLANTER.**—J. F. Champlin (assignor to himself, S. B. Thomson, and D. C. Corbin), Aurora, N. Y.

I claim, first, The combination of the cam spring, H, lugs, J, and spring, I, for the purpose of operating the slide, G, substantially as described.

Second, The arrangement of the lever, N, in connection with the cam spring, H, for the purpose of moving the cam spring beyond the touch of the lugs, J, when desired, substantially as described.

Third, In a machine for planting corn in hills, in which the plow frame is made separate from the main supporting frame, I claim suspending the plow frame under the main frame by means of a pendant hinged connection to the forward end of the main frame, in combination with a rear upward projection ball or handle (in near proximity to the driver's seat) so that the driver can conveniently lift and suspend the plows from the ground when turning round at the end of the rows (or otherwise) and again drop the plows to the ground as required, substantially as described.

**56,668.—SHEARS.**—P. C. Clapp, Dorchester, Mass., assignor to himself and Cotton C. Bradbury, Milton, Mass.

I claim the scissors as made with the auxiliary blades, e f, arranged and combined with the blades, a b, and their handles, c d, substantially as specified.

**56,669.—BREECH-LOADING FIRE ARM.**—Jacob O'Connor (assignor to the Empire Breech-loading Fire Arms Company), New York.

I claim the hammer, F, formed with a curved back and throat, said curve being concentric with the axis, f, of the hammer, in combination with the curved upper side of the projection, i, and rear upper edge of the mortise, G, substantially as and for the purpose specified.

**56,670.—PROCESS OF VULCANIZING INDIA-RUBBER IN CONNECTION WITH LEATHER.**—Alexander Cutter (assignor to Charles H. Hayward), Malden, Mass.

I claim the improved process of treating leather and rubber, during the vulcanizing of the latter, such consisting in the employment of air, in the vulcanizing chamber or furnace, in sufficient quantity to prevent the heat thereof from injuring the leather without materially impairing its vulcanizing effect on the composition of rubber and sulphur.

**56,671.—PUMP.**—Joseph W. Douglas (assignor to W. and B. Douglas), Middletown, Conn.

I claim the combination of the diaphragm, D, hollow piston rod, B, having a perforated enlargement, B', and piston, G, as described, valve H, with its spindle, d, and guide fingers, c, cylinder, L, and side-pipe, I, provided with valves, J and J', all arranged and operating substantially as described for the purpose specified.

**56,672.—SMUT MILL.**—Robert Heneage (assignor to self and J. D. Shepard), Buffalo, N. Y.

I claim the rings, f f, of the rotating disks, E, when provided with radial or tangentially-inclined ribs, e e, or their equivalent, in combination with the stationary rings, b, and ribs, i, arranged and operating substantially as and for the purpose set forth.

In combination with the above described device, I also claim the vertical ribs, p p, on the interior of the case, together with the hopper-shaped diaphragms, B B, arranged and operating substantially as described.

I also claim the guard ring, g, in combination and concentric with the ribbed ring, h, for the purpose of deflecting the rebounding grain beyond the inclined ring beneath, arranged substantially as specified.

**56,673.—MAPLE-FLAVORED SUGAR AND SIRUP.**—Charles McLean (assignor to himself, T. C. Hargraves, and Charles Mitchell), Boston, Mass.

I claim the within described new manufacture.

**56,674.—STENCIL NUMBERING APPARATUS.**—James M. Merritt (assignor to himself and John W. A. Myers), Buffalo, N. Y.

I claim the improved stencil numbering apparatus herein described, consisting of the plate or frame, A, with apertures, b c d, and the figure slides, 1 2 3, and guide f, or its equivalent, constructed and arranged substantially as described.

**56,675.—MACHINE FOR PICKING AND CLEANING COTTON AND WOOL.**—Stephen R. Parkhurst (assignor to Emily R. Parkhurst), Bloomfield, N. J.

First, I claim constructing the toothed rollers, b and c, with separate teeth set into grooves and secured as described.

Second, I claim the picker cylinder, formed of a series of longitudinally grooved bars, containing separate teeth and intermediate filling pieces, substantially as specified.

Third, I claim the cylinders d, f, and g, in combination with the strippers, h and i, substantially as and for the purposes specified.

Fourth, I claim the brush blower, l, and the condensing cylinder, m', in combination with the picker cylinder, d, and cylinder, f or g, substantially as set forth.

Fifth, I claim the rollers, r, r, in combination with the condensing cylinders, m' m', and oilers, t t, substantially as set forth.

Sixth, I claim, in a picker for wool and other fiber, arranging the said roller and toothed cylinder over the picker cylinder, so that dust and foreign substances shall fall into the space in which the picker cylinder revolves, and be thrown out by the centrifugal action of said cylinder, aided by a current of air, substantially as set forth.

**56,676.—CLOTHES WRINGER.**—J. N. Pease and G. Lewis, Panama, N. Y., assignors to the "Metropolitan Washing Machine Co."

First, We claim the method of gearing wringer rolls, as herein shown and described—that is to say, by the employment in connecting with the pinions or cog-wheels of the upper and lower rolls of a third or auxiliary gear wheel—the whole being so arranged that, while the relative positions of the said pinions to each other may constantly vary, they shall bear permanent or fixed relations to the auxiliary gear.

Second, Supporting one of the wringer rolls in upright disks, the said roll having its bearings placed eccentrically to the said disk, in combination with the auxiliary gear when arranged, to revolve upon the axis of said disks, the whole being arranged for operation as herein shown and set forth.

Third, In combination with the herein described arrangement of gearing rolls, we claim the cross bar, or the mechanical equivalent thereof, for connecting the disks which support the movable rolls, so that the said disks may be moved upon their axes in unison, and maintain the parallelism of the rolls in the movement of the one to and from the other substantially as herein shown and described.

Fourth, The combination and arrangement of the spring and disks supporting the movable roll, substantially as herein shown and set forth, so that the rolls are kept together with a yielding pressure which may be regulated as described.

Fifth, We claim the herein described device for holding the wringer to the side of the tub, the same consisting of bell-crank levers pivoted on the machine, in combination with an adjusting rod, the whole being arranged for operation substantially as herein shown and set forth.

**56,677.—GAS STOVE.**—Henry Pennie and E. A. Le-land, New York City, assignor to said Pennie.

We claim, First, the burner or burners located within the stove, and burning air and gas, in combination with the opening, h, for the admission of air to support the flame and produce the draught, and with a chamber above the burner, constructed and arranged substantially as described, by which combination and arrangement the flame is carried downward and toward the opening of egress, as set forth.

Second, We claim, in combination with the burner, the openings, h, for draught and the chamber above, substantially as specified, the employment of the very small apertures, j, arranged essentially as set forth, for the purpose of admitting a comparatively small amount of air to mix with the volatile products of the flame, and assist the consumption of such products as they are carried downward and over the flame, by which the burner is made use of to consume its own products of combustion, substantially as described.

**56,678.—SPRING BED BOTTOM.**—Milton Roberts (assignor to himself and John A. Lloyd), St. Paul, Minn.

I claim the straining screws, b b, or their equivalents, in combination, with a thin slat bed bottom, substantially as described, for the purpose of increasing or diminishing at will the tension of said slats.

**56,679.—PAPER-CUTTING MACHINE.**—J. F. and George W. Tapley (assignors to themselves and G. D. Tapley), Springfield, Mass. Antedated Feb. 5, 1866.

We claim, First, The method herein described of cutting paper and similar substances in the form of an arc of a circle, for collars and other purposes, by means of a revolving or circular knife, made to travel in an arc of a circle, or similar curve on which the paper is to be cut, substantially in the manner herein set forth.

Second, Arranging the knife, b, in the handle, d, so as to be adjustable by means of the set screws, e e, substantially in the manner and for the purpose herein described.

Third, Arranging the indenting or printing wheel, D, in connection with the cutting knife, b, substantially as herein set forth.

Fourth, In combination with the wheel, D, the spreading roll or rolls g, and inking plate, E, when arranged substantially in the manner and for the purpose herein set forth.

**56,680.—METHOD OF UNITING IRON AND STEEL.**—William and William H. Terwilliger, and John S. Lockwood, New York City.

We claim, First, The welded combination of iron and steel plates to make the shell of a safe, for safety against burglarious attacks.

Second, The process of welding iron and steel plates by the use of the composition of borax and saltpetre in paint form laid on the surfaces to be united, heated not above 1500° F., and rolled with great pressure, to make the best weld possible in the materials for burglar-proof safes.

Third, Interposing a steel plate between two iron plates, with the use of the welding composition and process above described, to make economical materials for burglar-proof safes.

Fourth, Interposing a plate of iron between two plates of steel, with the use of the welding composition and process above described, to make the strongest and best materials for burglar-proof safes.

Fifth, Constructing and preparing the materials for a burglar-proof safe by rolling and punching while hot, so that the parts of it can be put together after transportation in the manner described.

Sixth, Making a burglar-proof safe in mutually fitting parts, and numbered, so that, from a stock of the materials on hand, a safe of the desired size and strength could be put together in a few minutes in the manner described.

**56,681.—CARRIAGE WHEELS.**—Jacob Woodburn (assignor to himself and Thomas Scott), St. Louis, Mo.

I claim an oval or elliptical-shaped tenon for wheel spokes, in combination with a round-shaped mortise hole in the wheel rim therefor, substantially as herein described and for the purposes specified.

**56,682.—MACHINE FOR POLISHING ENAMELED PAPER.**—Wilbur F. Wright, Nashua, N. H., assignor to himself and Edwin B. Blood, Newburyport, Mass.

I claim, First, The combination of the two sets of rollers, H I and F G, when the roller, I, revolves at a higher velocity than the roller, G, substantially as herein set forth, for the purpose specified.

Second, The combination and arrangement of the pressing and smoothing rollers, C D, the burnishing roller, G I, and supporting rollers, F H, substantially as herein set forth, for the purpose specified.

**56,683.—WATCH.**—Charles Lehmann, Bienne, Switzerland.

I claim the arrangement of the clutch, c c', in combination with the rod or stem, t, constructed as described, and capable of being connected medially or immediately with the wheel which controls the mainspring, and with the minute wheel of the watch, substantially as herein set forth.

**56,684.—SAW FOR COTTON GIN.**—Thomas C. Craven, Albany, N. Y.

I claim a saw for cotton gins formed with rounded teeth of the character specified, as and for the purposes set forth.

**56,685.—MANUFACTURE OF WHITE LEAD.**—Thomas M. and Ambrose G. Fell (assignors to selves and William Bell), New York City.

First, We claim the treatment of sulphate of lead with alkaline substances, or their salts, in the manner and for the purposes substantially as above described.

Second, the treatment of the sulphate of lead with the carbonates of either potash, soda, or lime, followed by the alkaline substances, or their salts, in the manner and for the purposes substantially as above described.

Third, The treatment of sulphate of lead with the carbonate of soda or potash, in the manner and for the purposes substantially as described.

Fourth, The manufacture of white lead from ores of lead, or metallic lead, by the use of nitric and sulphuric acids, in combination with alkaline substances, or their salts, either with or without the prior treatment of carbonates of potash, soda, or lime, in the manner and for the purposes substantially as above set forth.

**56,686.—COOKING STOVE.**—Esek Bussey, Troy, N. Y.

First, I claim the annular surrounding and downward projecting flange, D, or any equivalent thereof, in combination with the boiler or reservoir, A, in the manner substantially as and for the purposes herein described and set forth.

Second, I claim the apertures, d, in the boiler or reservoir, A, in combination with the exit flue or flues in the rear end of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

Third, I claim the arrangement and combination of the lid or cover, E, with the reservoir, A, so that the water or moisture on the under side thereof, by reason of condensation of steam, may and shall pass or drip into said boiler, A, in the manner substantially as herein described and set forth.

Fourth, I claim the arrangement and employment of the intermediate and vertical plate, F, in combination with the said reservoir, A, in the manner and for the purposes substantially as herein described and set forth.

## REISSUES.

**2,319.—COOKING STOVE.**—Esek Bussey, Troy, N. Y. Patented Dec. 5, 1865.

I claim, First, The outward continuation or extension of the top plate, E, of a cooking stove, over and upon, or near to the upper part or top boiler or reservoir, A, and containing therein an opening or reservoir aperture, E', for receiving into said boiler, A, in the manner substantially as herein described and set forth.

Second, I claim the supporting of the boiler or reservoir, A, upon the vertical end plate, C', in combination with the top plate, E.

of a cooking stove projecting or containing outward with an opening or aperture, E, therein, or any equivalent thereof, in the manner and for the purposes substantially as herein described and set forth.

Third, I claim the employment of the boiler or reservoir, A, having its upper end or part in combination with the opening or aperture, E, in the top projecting plate, F, of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

Fourth, I claim the arrangement in a cooking stove, of a boiler or reservoir, A, and an exit passage for the gases of combustion, both at one end of the stove, and so that said boiler forms a part of the lateral casing, on the outer side of a fire flue, or fire flues in the end of the stove, below the said exit passage, in the manner substantially as and for the purposes herein described and set forth.

Fifth, I claim the employment and arrangement of the boiler or reservoir, A, or any equivalent thereof, within and upon the rear end of a cooking stove, and wholly or partly below the top plate thereof so that one side of such boiler, shall form and complete the lateral casing of the rear end vertical flue or flues below the top plate thereof, and the bottom of said boiler in the manner and for the purposes substantially as herein described and set forth.

Sixth, I claim the construction of the rear end, and vertical flue or flues of a cooking stove, by means of the boiler or reservoir, A, and the lower vertical end or boiler supporting plate, C, so that the hot air or heated products of combustion shall come into direct contact with that part or portion of such boiler next adjoining such flue or flues so as to warm or heat the water or other material in said boiler, in the manner substantially as herein described and set forth.

Seventh, I claim the removing of the lateral or vertical outside casing of a cooking stove, or some part, or portion of the same, so that the hot air or heated products of combustion, may or shall come into contact with the boiler or reservoir or some part or portion thereof next adjoining thereto, or in combination therewith in the manner and for the purposes, substantially as herein described and set forth.

**2,320.—APPARATUS FOR WASHING AND BLEACHING FIBROUS AND TEXTILE SUBSTANCES.**—John G. Ford, Philadelphia, Pa., assignee by mesne assignments of J. A. Jillson and H. Whinfield, New York City. Patented Oct. 9, 1855.

I claim, First, The process of washing, cleansing or extracting gum, dirt or other similar matter from fibrous and textile substances or materials by inserting them in a closed vessel or receiver and forcing the cleansing or extracting fluids to circulate through the materials by the action of a pump.

Second, The rinsing of the materials by forcing fresh cleansing fluids into and through the fibrous and textile substances and materials, and out of the closed washing or extracting chamber by means of a pump.

Third, The forcing of a bleaching solution to circulate through the mass of fibrous and textile substances and material contained within a closed receiver or extracting chamber by means of a pump.

Fourth, The combination of a closed receiver or extracting chamber or vessel with a pump for causing a direct circulation through it, as described.

Fifth, The employment in a closed vessel or receiver of an upper strainer or perforated diaphragm for causing a uniform distribution of the liquid upon the matter treated in combination with a lower perforated diaphragm or strainer for permitting the circulation of the extracting, cleansing or bleaching liquid.

Sixth, The employment of a closed vessel for cleansing or extracting with a fire below, and having a lower perforated diaphragm, whereby the material is above the bottom of the boiler and prevented from being acted upon by the fire.

Seventh, Forming within a closed receiver or extractor a chamber below the lower diaphragm for the cleansing or extracting liquid.

Eighth, The combination of the closed cleansing or extracting vessel, the heater and the pump for forcing the heated liquor to circulate through the mass.

Ninth, The combination of the closed receiver or extracting vessel, the lower perforated diaphragm or strainers, the heater and the pump.

Tenth, The combination of the closed receiver or extracting vessel, the upper and lower perforated diaphragm or strainer and the pump, I.

**2,321.—MACHINE FOR CUTTING BOOT AND SHOE SOLES.**—Jesse W. Hatch and Henry Churchill, Rochester, N. Y.

We claim the reciprocating cutter shaft, A, having the endless edged knife or die, C, attached thereto, when the same is made to perform half a revolution between successive cutting strokes, by means of the segment gear, F, or other equivalent means for that purpose, operating substantially as described.

We also claim the reciprocating cutter shaft, when the same is used in connection with the cutting block, M, and guide bar, J, or their equivalents.

We also claim the said cutter shaft, A, guide bar, J, cutting block, M, and discharging plate, T, or their equivalents combined and operating together, substantially as described.

**2,322.—HEATING STOVE.**—John W. Lane, Newton, N. J. Patented June 20, 1865.

I claim the fuel chamber, C, having its front plate, W, extending downward, leaving the space, O, through which the circuit draught enters the front chambers, D' D', substantially as described, for the purpose specified.

Second, The fuel chamber, C, having its front plate, W, extending downward, leaving the space, O, and having its back plate, G, resting directly upon the bottom plate of the stove and provided with the grate, F, substantially as described and for the purpose specified.

#### DESIGNS.

**2,364.—BRACKET.**—John M. Bellamy (assignor to David A. Titcomb of one-half of said Invention), Charlestown, Mass.

**2,365, and 2,366.—CHANDELIER.**—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass. Two Cases.

**2,367.—BRACKET AND LAMP.**—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

**2,368.—CLOCK.**—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

**2,369.—PENDANT LIGHT.**—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

**2,370.—WATCH PLATE.**—Edward Howard, Boston, Mass.

**2,371.—TETTED GOODS.**—Moses A. Johnson, Lowell, Mass.

**2,372.—TRADE MARK.**—Edward Locker, Newark, N. J.

**2,373.—TRADE MARK.**—R. J. Roberts, New York City.

**2,374.—TRADE MARK.**—David Shirrell, Buffalo, N. Y.

**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 our receipt 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 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.

#### THE TURNER'S COMPANION.

**JUST PUBLISHED:**  
THE TURNER'S COMPANION, containing instructions in Concentric, Elliptic, and Eccentric Turning; also various plates of Chucks, Tools, and Instruments; and directions for using the Eccentric Cutter, Drill, Vertical Cutter, and Circular Rest; with patterns and instructions for working them. A new edition in one vol., 12mo., \$1.50 by mail, free of postage.

**CONTENTS:**  
Preface; History of the Lathe; Arc patterns described; how worked; observations upon; Balls, Chinese; how turned; and hollow spheres; Black dye for ivory; Bleaching ivory; Boring collars; Boring tools; how to use properly; Bottle; Box, how made; how polished; lined with orange-peel; tortoise-shell; Brass wheel; Catgut, advantage of; Cement for ivory; for turners; Circular rest; Saw; Circles, how to begin; with eccentric chuck; Chain; Chisels; Chucks; to make in wood; choice of wood for; centering wood for; for work; traversing; how to use; Copper tools; Drill; shape and uses; description of tools belonging to; Eccentric turning; cutter described; its uses; its tools; patterns; chuck; how to use; patterns; Eccentric cutter and chuck united; patterns worked with them; pillars; Elliptic machine; Flowers turned in ivory; Glue, to make; to use; Goniometer; Gauge; Hand saw; Handles of tools; Holly used for ivory; Hook and eye, how to use; Impressions of turning patterns; Ivory preferable to wood; how to polish; proper tools for turning; to cleanse from grease; to dye red; to dye black; Lashes; metallic and wooden; construction of; proper situation for; Lighter case; Lining patterns; Lines in ivory filled with ink; Mandrel described; Mastic, for turning ivory thin; to cleanse the ivory from; Milling tools; Molding tools; Needle cases; Over-head frame; Ornamental stoppers; Parallel rest; how to use; to move for side work; Pen holder; Point tools; Polishing soft wood; hard wood; tortoise-shell; Printing in the lathe; Puppet; Rest; Regulating the chuck wheel; Right-side tools; Rings, to make; Snuff-box, lined with tortoise-shell; Saws; Scraping tool; Screws; tools for cutting; Spiral turning; Table of numbers; Tap; Tenon saw; Tools; proper method to sharpen; Tool rack; Tortoise shell; Traversing mandrel; chuck; Turned temple; Turning patterns; Twisted pillar, support for; Vertical cutter; Vandyke pattern; Varnish used in lathe; Woods, English; foreign; to imitate mahogany; to stain red; yellow; black; purple; mahogany.

My new Catalogue of Practical and Scientific Books, complete to July 1, 1866, sent free of postage to any one who will favor me with his address.

**HENRY CAREY BAIRD**, Industrial Publisher, No. 406 Walnut street, Philadelphia. 61

#### NYSTROM'S NEW BOOK ON PROPELLERS.

**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. By mail, free of postage. \$2.50.

Among the varied and valuable contents of this able book will be found descriptions of the best Propellers now in use, with illustrations and directions for their construction, such as the following:—

Review of Screw Propellers; To Construct a Plain Screw; Propeller with a Compound Expanding Pitch; Propeller as Constructed by Chief Engineer Isherwood; Propeller as Constructed from Mr. Isherwood's Drawings; Centripetal Propeller; Centripetal Propeller with Compound Expanding Pitch.

My New Catalogue of PRACTICAL & SCIENTIFIC BOOKS, complete to July 1, 1866, is just ready and will be sent free of postage to any one who will favor me with his address.

**HENRY CAREY BAIRD**, Industrial Publisher, 406 Walnut street, Philadelphia. 62

#### PRACTICAL

#### AND SCIENTIFIC BOOKS:

**AMERICAN MILLER AND MILLWRIGHT'S ASSISTANT:** A new and thoroughly revised Edition, with additional Engravings. By William Carter Hughes. In one Volume. 12mo. \$1.50.

**ARMENGAND, AMOROUX, AND JOHNSON, THE PRACTICAL DRAUGHTSMAN'S BOOK OF INDUSTRIAL DESIGN, and Mechanist's and Engineer's Drawing Companion;** forming a complete course of Mechanical Engineering and Architectural Drawing. From the French of M. Armengand the elder, Prof. of Design in the Conservatoire of Arts and Industry, Paris, and MM. Armengand the younger, and Amoroux, Civil Engineers. Rewritten and arranged with additional matter and plates, selections from and examples of the most useful and generally employed mechanism of the day. By William Johnson, Assoc. Inst. C. E., Editor of "The Practical Mechanic's Journal." Illustrated by fifty folio and steel plates, and fifty wood cuts. A new edition. 4to. \$10.00.

**ARROWSMITH, PAPER-HANGER'S COMPANION.** By Jas. Arrowsmith. 12mo. cloth. \$1.25.

**BAIRD, THE AMERICAN COTTON SPINNER, AND MANAGER'S AND CARDER'S GUIDE:** A Practical Treatise on Cotton Spinning; giving the Dimensions and Speed of Machinery, Draught, and Twist Calculations, etc.; with notices of recent improvements; together with Rules and Examples for making changes in the sizes and numbers of Roving and Yarn. Compiled from the papers of the late Robert H. Baird. 12mo. \$1.50.

**Contents:**—Introduction; On the Plan of a Factory Building; On the Main Gearing; On Water wheels; Calculations of Horse Power for Propelling Cotton Spinning Machinery; Willie or Picking Machine; On Willeying Cotton; Spreading Machine; On Spreading Cotton; Carding; Cards and Carding; Covering Emery Rollers and Emeries; The Drawing-frame; Roving; General Remarks on Drawing and Roving; Throades; Remarks on Throades; Mule Spinning; General observations on Mule Spinning; Weaving; Belting; Miscellaneous matters.

**BLINN, A PRACTICAL WORKSHOP COMPANION FOR TIN, SHEET-IRON, AND COPPER-PLATE WORKERS:** Containing Rules for describing various kinds of Patterns used by Tin, Sheet-Iron, and Copper-Plate Workers; Practical Geometry; Mensuration of Surfaces and Solids; Tables of the Weights of Metals, Lead Pipe, etc.; Tables of Areas and Circumferences of Circles; Japan Varnishes, Ladders, Cements, Compositions, etc., etc. By Leroy J. Blinn, Master Mechanic. With over One Hundred Illustrations. 12mo. \$2.50.

**BOOTH AND MORFIT, THE ENCYCLOPEDIA OF CHEMISTRY, PRACTICAL AND THEORETICAL:** Embracing its application to the Arts, Metallurgy, Mineralogy, Geology, Medicine, and Pharmacy. By James C. Booth, Melter and Refiner in the United States Mint, Prof. of Applied Chemistry in the Franklin Institute, etc., assisted by Campbell Morfit, author of "Chemical Manipulations," etc. 7th edition. Complete in one volume, royal 8vo, 978 pages, with numerous wood cuts and other illustrations. \$3.00.

**BREWER: (THE COMPLETE PRACTICAL.)** Or, Plain, Concise, and Accurate Instructions in the Art of Brewing Beer, Ale, Porter, etc., etc., and the Process of making all the Small Beers. By M. Lafayette Byrn, M.D. With illustrations. 12mo. \$1.25.

The above, or any of my Practical and Scientific Books sent by mail, free of postage, at publication price. My new catalogue sent free to any one who will furnish me with his address.

**HENRY CAREY BAIRD**, Industrial Publisher, 406 Walnut street, Philadelphia. 61

**LATHES, PLANERS, AND OTHER TOOLS,** on hand and to order, from Lowell Machine Shop. STEVENSON & PIERSON, 45 Kilby street, Boston. 613

#### THE PEOPLE'S NEWSPAPER—

#### "THE PEOPLE,"

A Weekly, devoted to Literature, News, and the Industrial Interests of the People, is respectfully offered to the patronage of the public. The paper was started last April, and has met with encouraging success. It discusses the great questions of the day—Labor and Capital—and analyzes them with reference to their bearing upon the industry of the people. It hopes to render those vital and interesting subjects clear and patent to the comprehension of its readers, and aims to be regarded as the true exponent of the interests of every Workingman, and the recognized champion of his rights. Issued every Tuesday morning from the Office, No. 5 Frankfort-st., New York. Subscriptions \$2.50 per annum, payable in advance. New York, August, 1866. 1\*

#### CHANCE FOR INVESTMENT.—

**DOTY'S WAGON JACK** is another new machine, which commended itself to every one present, the moment it was exhibited. In simplicity, effectiveness, lightness, and cheapness, it stands ahead of all others.—*Am. Inst. Farmers' Club Report.* \$50 for County Rights, \$75 for two, \$100 for four. Some tip-top Counties still unsold. Counties under 10,000 population, half-price. Salesmen of Rights and Machines wanted. Sample Jacks by Express on receipt of \$1.00. W. M. DOTY, 33 Cortlandt-st., New York. 1\*

#### MORSE'S PATENT TWIST DRILLS, CHUCKS, SOCKETS, etc.

A full assortment may be found in New York at F. W. Bacon & Co.'s, 81 John street; Peter A. Frasse, 95 Fulton street; Nathaniel 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, 1233 Market street. In Hartford, at Francis & Gridley's, 843 Main street. In San Francisco, at Marsh, Pilsbury & Co.'s, corner Pine and Front streets. In London, England, at Keith & Co.'s, 16 1/2 Fenchurch street, and at the Factory, corner Fourth and Bedford streets, New Bedford, Mass. 6



#### WINSLOW, GRISWOLD, & HOLLEY, Troy, N. Y.,

Makers of **BESSEMER CAST STEEL** Crank, and other Shafts and Axles. Piston Rods, Crank Pins, Lathe Forgings, Blooms, 3 to 6-in., round or square, forged steel, Rivets, Nails, Machine-ry forgings, Boiler Plates, Machine-ry Castings. Soft Cast Steel.

In Bars and Rolls, for Machinery purposes. Weldless Cast Steel Locomotive Tires, all steel, and Steel Headed Rails. Cast Steel Ingots. For Rolling or Forging. 250 to 4,500 lbs. 611

#### 20 PORTABLE FORGES, NEARLY NEW,

at half-price, for sale by G. M. Way & Co., Hartford, Smith & Kimberly, New Haven, Perry & Johnson, Bridgeport, F. L. Allen, Waterbury, Conn., & A. S. Barstow & Co., 133 Front street, New York. 1\*

#### DEPARTMENT OF ENGINEERING, YALE COLLEGE.

Courses of instruction in the various branches of Civil and Mechanical Engineering, occupying three years, are regularly given in the Sheffield Scientific School of Yale College. The next College year commences on the 15th of September. For Circulars, giving further information, address Prof. WM. A. NORTON or C. S. LYMAN, or the Secretary of the School. Prof. GEO. J. BRUSH, New Haven, Conn. 631

#### WINANS'S Incrustation Powder. Successfully

used Ten Years. Proves Efficient in preventing Scale. No foaming, nor explosions, nor corrosion. H. W. WINANS, N. Y.

#### THE UNIVERSAL FAMILY GAS MACHINE,

the cheapest, simplest, most convenient, and portable Machine yet invented. No smell, no smoke, will illuminate a whole building with less trouble than is required for a single ordinary Lamp. Where gas pipes are in the house, no changes are necessary. Machines of any capacity for sale. Also, State Rights. J. McDUGALL, 79 Nassau street, Room 16. 1\*

#### 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. 61 Nassau street, New York City. Old diamonds reset. N. B.—Send postage stamp for descriptive circular of the Dresser. 612

#### IRON AND WOOD-WORKING MACHINERY

Constantly on hand, at Manufacturer's prices, Machinery Depot. HAWKINS & JAMES, South Wells street, Chicago, Ill. 63\*

#### GOULD MACHINE COMPANY,

Newark, N. J. IRON AND WOOD-WORKING MACHINERY, STEAM FIRE ENGINES. Send for a Catalogue. 3 1/2

#### 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, Commissioners. 551

#### BROUGHTON'S PATENT GAGE COCKS,

Graduating Lubricators, Transparent Oil Cups, Warranted the best in the Market. Sold Wholesale, by John Ashcroft, Todd & Rafferty, Woodward Steam Pump Co., and all large dealers. 5 1/2 Broughton & Moore, Manufacturers, New York.

#### STIMPSON'S SCIENTIFIC STEEL PENS.

Patented March 20th, 1865. Agencies wanted in every city of the Union. Retail price \$2 per Gross. Liberal discount to the Trade. WM. B. STIMPSON, General Agent, 37 Nassau street, Room 38, New York. 62\*

#### PATTERN & MODEL MAKERS,

Gearing Cocks, Valves, and Engines Patterns of every description. COTTON GINS! COTTON GINS!! COTTON GINS!!! Improved Double or Single-roller Sea Island Cotton Gins constantly on hand. Apply to ANDERSON & SCHERMERHORN, Rear of 47 Ann street, New York. 64

## 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 tons 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.

## TOWER'S

## ALCOHOL PROCESS OF TANNING.

Patented Dec., 1893; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months.

It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better. Every one knows the preservative effect of alcohol upon all animal matter.

It is applicable either to limed or sweatened skins or hides. From sweatened skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market. No complicated or expensive machinery is needed. Any tannery may be adapted to the use of this process, for less than one hundred dollars.

Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston

L. FREDERICK RICE, Agent.

**\$150 A-MONTH! NEW BUSINESS FOR AGENTS.** [19 13\*] H. B. SHAW, Alfred, Me.

## 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. HODLEY & 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. 1 tf

## J. A. FAY &amp; 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, Ship Yards, Railroad, Car and Agricultural Shops, Mills, Etc.  
Sash, Blind and Door, Wheel, Felly and Spoke, Stave and Barrel, Shingle and Lath, Planing and Resawing

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 ly

## R. BALL &amp; CO.

SCHOOL STREET, WORCESTER, MASS., Manufacturers of Woodworth's, Daniel'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\*

## LENOIR PATENT GAS ENGINES.—WITH-

out 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.

## GROVER &amp; 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. Wood-working 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, Cossack, N. Y. 1 tf

**\$1500 PER YEAR**, paid by **SHAW & Clark**, Biddeford, Me., or Chicago, Ill. 19 13\*

## ATMOSPHERIC TRIP HAMMERS.

Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by **CHARLES MERRILL & SONS**, No. 556 Grand street, New York. They are very simple in construction, require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or sawing they are unequalled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x36 inches floor room. Send for circular giving full particulars. 1 tf

## 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 tons weight, made in green sand, dry sand or loam, as desired; Also Fine 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\*

## IMPORTANT TO RAILROAD TRAVELERS.

THE PORTABLE RAILWAY HEAD-REST or POCKET-BERTH. Patented July 4th, 1893. SUBSTANTIAL, SIMPLE, COMPACT. By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railway Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made. Agents wanted in all the principal cities. Address **JOHN R. HOOLE**, Selling Agent, [19 13\*] No. 124 Nassau street, New York.

**ERICSSON CALORIC ENGINES OF GREAT- LY 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 horsepower 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

**THE AMERICAN VISE—A WELL-CON- structed 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\***

**INCORUSTATIONS 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\*

**AMERICAN EMERY.—GUARANTEED SU- perior 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\***

**ROCKWOOD & CO., PORTRAIT, LAND- scape, and mechanical photographers, 339 Broadway, New York.** This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 19 13\*

**PEQUOT MACHINE CO., MYSTIC RIVER, CONN., Manufacture the most Improved L O O M S**

FOR WEAVING TAPES, BINDINGS, WEBBING, RIBBONS, ELASTIC GOODS, AND ALL KINDS OF NARROW FABRICS.

Our Looms will run faster, do more work, are less liable to get out of order than other kinds, and are warranted superior to all others in every respect. Supplies of all kinds furnished for the same. 24 8\*

**FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machine, address J. A. FAY & Co., Cincinnati, O. 3 ly**

**"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 HOLSK & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 1 tf**

## 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, 1896, in No. 21 of this paper, to which reference is made. 26 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 13\*

## 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\*

## FOR DANIELLS'S PLANING MACHINES,

Car Mortising, Boring Machines, Car Tenoning Machines, Car Planing and Beading Machines, etc., address **J. A. FAY & CO., Cincinnati, Ohio. 4 ly**

## IRON PLANERS, ENGINE LATHES, DRILLS,

and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address **26\* NEW HAVEN MANUFACTURING CO., New Haven, Ct.**

## 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**, 81 Newark Avenue, Jersey City, N. J. 3 tf

## 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\*

## TWIST DRILLS (ALL SIZES) FOR STUBBS'S

Wire and Machinists' use, on hand for sale by **LEACH BROTHERS**, 102 Liberty street, New York. 26 13\*

## VAN DE WATER CELEBRATED WATER

Wheel for sale at the Eagle Iron Works, Buffalo, N. Y. Send for Circulars. [26 8\*] **DUNBAR & HOWELL.**

## WE WILL CONTRACT

FOR THE MANUFACTURE OF ANY KIND OF Machinery requiring good workmanship. Punching Presses, Dies, and tools of all kinds. Have unusual facilities for doing this class of work promptly. **MOSES G. WILDER & CO.** West Meriden, Conn. 16\*

## CAUTION.—THE PUBLIC ARE HEREBY

Informed that the Patent of Hewitt & Haly, bearing date May 8th, 1896, is subordinate to the Patent covering "Ashcroft's Low Water Detector, all infringements will be prosecuted to the extent of the law. **JOHN ASHCROFT**, 50 John street, New York. 4 4)

## OLMSTEAD'S PATENT FRICTION CLUTCH

PULLEY is adapted to any machine that runs with a belt, and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line. Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently or to speed up instantly.

Parties wanting these Pulleys are invited to correspond with **WM. M. BETTS**, Sole Proprietor, Stamford Machine and Tool Works, Stamford, Conn. 19 13\*

**THE BEST FORGING 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. 4 tf

## TO RAILROAD AND TELEGRAPH COM-

PANIES.—Telegraph Circuit Breaker and Signal Apparatus. Is readily used by Conductors and Brakemen, and all hindrances to trains on the road immediately telegraphed to dispatcher's office. Also, of great value in testing wires out upon the line. Address [4 15\*] **ALONZO CHACE**, Syracuse, N. Y.

## BROUGHTON'S OILERS.—THE DOUBLE

Bottom, The Seamless, The Engineers', The Double-acting, and the Transparent Top. Sold at first-class Hardware stores. 4 13] **BROUGHTON & MOORE**, Manufacturers, New York.

## BULLARD &amp; 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 specialty of shafting, we are able to furnish very superior work at reasonable rates. Heavy work built to order. 2 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.

## ANDREWS'S PATENT PUMPS, ENGINES,

etc.—CENTRIFUGAL PUMPS, from 50 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 1/2 to 6 tons.

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

## 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**, 728 Chestnut street, Philadelphia. 21 52\*

**GODDARD'S BURNING MACHINE WORKS,** Office, No. 3 Bowling Green, New York, manufacture the Patent Steel Ring and Solid Packing BURNING MACHINES.

Patent Mestizo Wool-burning Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.

Orders respectfully solicited, and prompt attention given, by addressing **C. L. GODDARD**, No. 3 Bowling Green, N. Y. 26 tf

## ENGINEERING SCHOOL, FRANKLIN, N. Y.,

has full equipment, and offers thorough instruction. Special advantage—the small cost of living. For Circulars address **G. W. JONES, A. M.** 21 12\*

## WHEELER &amp; WILSON, 625 BROADWAY,

N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 14 tf

## AMERICAN PEAT COMPANY.—THIS COM-

pany, 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, 42 1/2 Kilby st., Boston.

## M. BAILEY &amp; CO.,

PROVISION BROKERS, No. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 18\*

## STEAM ENGINES WITH LINK MOTION,

Variable Automatic Cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, etc. Address **M. & T. SAULT**, New Haven, Conn. 7 26\*

## 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. 23

## 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**, Slatersville, Ill. R. I. 20 26\*

## REYNOLDS'S TURBINE WATER WHEELS!

**REYNOLDS'S PATENT SWEEPS THE FIELD!** New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Works; Compact for Shipment; Great Water Saver.

THE ONLY WHEEL THAT EXCELS OVERSHOTS! Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. **GEORGE TALCOTT**, Late TALCOTT & UNDERHILL, No. 96 Liberty street, N. Y. 21 13\*

## TO WRENCH MAKERS.—FOR SALE UPON

Reasonable Terms, a valuable patent on a Pipe-Wrench. Address, [26 11\*] **A. B.**, New York City, Box 773.

## ONONDAGA STEEL WORKS.

ESTABLISHED 1883. We can furnish from our Stock nearly all Sizes of Square, Flat, Octagon, or Round Tool Steel, from 1/4 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.

**GILCHRIST, PIES & SHIPMAN**, 40 Broad street. 3 13\*

## BUERK'S WATCHMAN'S TIME DETECTOR.

Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular.

**J. E. BUERK**, P. O. Box 1,037, Boston, Mass. 26 18\*

## LITTLEFIELD'S PATENT SCAFFOLDING.

One of the simplest and best contrivances for Builders and Painters that has ever been invented, is the Scaffolding recently patented by the subscriber.

The utility and simplicity of this scaffolding, and the safety and ease with which it is adjusted, recommends it to all who have occasion to use the article. State, County, or Single Rights for sale low. Address **HORACE LITTLEFIELD**, Lewis Cass county, Iowa. 4 3\*

**Improved Green-corn Cutter.**

Green corn is a delicious vegetable, and a pile of smoking ears, covered with a snowy napkin, maketh glad the heart of man. The pleasure of eating it, however, is much lessened by the necessity of gnawing it off the cob—somewhat after the manner of that other beast from which come hams and lard.

When the kernels are shelled or cut from the cob, all the annoyance is obviated, and for many dishes it is desirable to have the corn so prepared. For this purpose the utensil here shown is claimed to be efficient. It consists, simply, of two semi-circular knives, A and B, fastened to a spring handle, C. These knives are peculiar in form and operate on the kernels by being forced down against them from the top, as shown in the engraving. The opening in the center of the knives is sufficient to insert the ear; as they are pushed down they strip off the kernels, leaving the cob bare. The bottom of the ear is held in place by a short spur, D, on the tin plate which goes with the knife.

This is a useful invention for persons who put up cans for winter use, and is claimed to act efficiently in all cases. It was patented on April 10, 1866. For further information address William C. McGill, of 277 Walnut street, Cincinnati, Ohio.



McGILL'S GREEN-CORN CUTTER.

**ROWELL'S MOVEMENT.**

Dr. Warren Rowell, of New York City, has shown us a mechanical movement of which he claims to be the first inventor. It is illustrated herewith, and is capable of transmitting motion from one shaft to another without the use of a belt. Continuous rotary motion, obtained by revolving the pulley shaft, is imparted to the secondary shaft through the connecting rods. Many cases arise in mechanics where



both belts and trains of gears are objectionable. In such places the arrangement above will be found useful where the distances between centers are not too great.

This movement is akin to another in which rotary motion is obtained from one rod connected to cranks, one of which is on the top and the other on the bottom center; the middle of the rod being carried in a slide, which moves back and forth with it.

**How Gutta Percha is Obtained.**

This gum is obtained from the trees when they are about thirty years old. The natives of the Malayan peninsula and of Borneo, obtain it by the destruction of the trees. Attempts have been made to induce them to procure the sap by tapping, but the coagulation of the gum at the apertures, by exposure to the atmosphere, makes it difficult to obtain it in paying quantities. The natives boil the mass in water to soften it, cut it into strips, and then knead it with their feet while plastic, forming it into cakes.

**Singular Freak of Lightning.**

A correspondent of the Hartford Press, writing from South Canaan, Conn., says that during a thun-

der storm on the 17th of July, a little girl ten years old was prostrated by an electric shock, while standing on a veranda with a hand on a tin conductor, or water pipe, leading from the eaves. The electricity struck the roof, tearing off the slate, and then passed down the pipe, which was at the time full of water. The pipe did not seem to be injured, but the child's hand, arm, and breast appeared as if scalded, and on the breast was a blister about as large as a

when the sheath or bracket can be slipped from the base, E, if desired. It will be noticed that the heads of the screws or nails that secure the fixture to the window frame, are all concealed. It seems to be a neat, handy, and efficient device.

Patented through the Scientific American Patent Agency June 5, 1866. For further particulars address G. W. Nell, 403 Noble street, Philadelphia.

**Improved Cartridge Box.**

The common cartridge box is open to serious objections, as was often demonstrated during the late war. The hindrance to rapidity of loading during action by the necessity of lifting the protecting flap, the unsafe character of the box when its contents were subjected to the sudden jolts of a movement on the double-quick, and the lack of capacity for a sufficient number of charges, made the common cartridge box an annoyance.

Paul F. Schneider, Hartford, Conn., has designed an improvement, the patent of which is now pending through the Scientific American Patent Agency, and is designed to obviate these difficulties. His box is cylindrical in form, slung by a shoulder strap and hanging vertically at the side. It is intended to contain at least sixty rounds of metallic cartridges. The box is in two parts, the lower section just deep enough to contain two cartridges, the upper one of which projects its fulminating, or rear end, above the surface of the cylinder. These cartridges are held in tubes and dropped in ball first, one on the top of the other.

Between the lower and upper sections of the box is a space sufficient to receive a gripe of two jaws, formed on a segment of a circle corresponding with the diameter of the cartridge, and calculated to retain the upper cartridge in the lower section of the cylindrical receptacle, by suspending it from the gripe or jaws at the head, which contains the fulminate. Through the outer covering of the cartridge box is an opening corresponding with the tubes containing the cartridges, and as the cylinder is rotated on its axis the tube, coming in line with the aperture, delivers a single cartridge, the upper one being retained by the gripe and sliding over until it drops into the bottom ready for delivery.

Cartridge boxes have before been used for delivering a series of cartridges for a magazine gun, but the principal distinctive feature of this is its quality of delivering only one cartridge at a time, although the tube in line with the discharge orifice may contain a number. A contract has been made to furnish this box to the Prussian Government. Further information can be obtained by addressing W. H. D. Callender, Hartford, Conn.

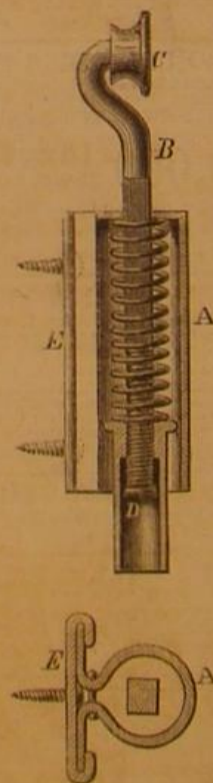
cent. She was prostrated and rendered insensible, but was restored by the use of cold water.

**NELL'S ADJUSTABLE SPRING BRACKET FOR WINDOW SHADES.**

Every one using a window shade, the cord of which is secured by a bracket at the bottom, knows that the tension of the cord varies with the state of the atmosphere. The cord contracts in moist weather and increases the tension. Sometimes, also, the pulley upon which the cord runs, on the curtain roll, is not properly centered, and the action is uneven.

The object of the improvement illustrated by the annexed engraving, is to insure a uniform tension at all times—the tension of the cord not depending upon a fixed, immovable point, but being graduated by a spiral spring readily yielding to increased tension.

The bracket, A, of thin metal receives the stem, B, which passes through a square hole in the top of the sheath, and sustains on its upper end the pulley, C. Around the stem, inside the sheath, is a spiral spring which can be shortened by means of the screw tube, D, which slides freely through an aperture in the bottom of the sheath. By turning this tube to the right it screws up on the stem and increases the resistance of the spring, and, by turning it to the left the tension of the spring is relaxed. An upward pressure on the end of the tube with the thumb, will readily disengage the cord,

**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.

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. 7.  
[NEW SERIES.]

NEW YORK, AUGUST 11, 1866.

\$3 per Annum,  
[IN ADVANCE.]

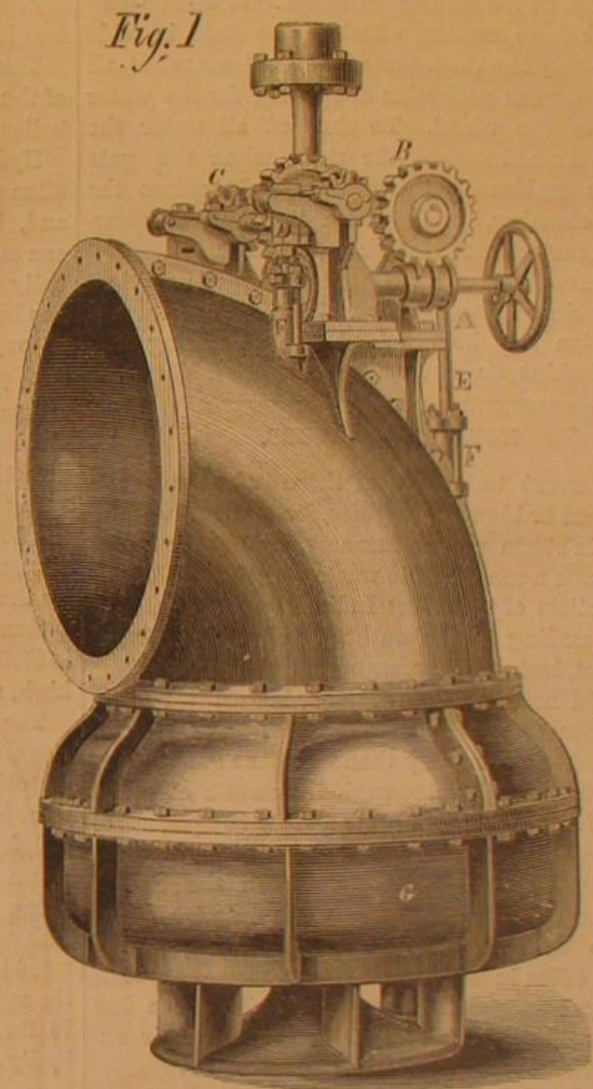
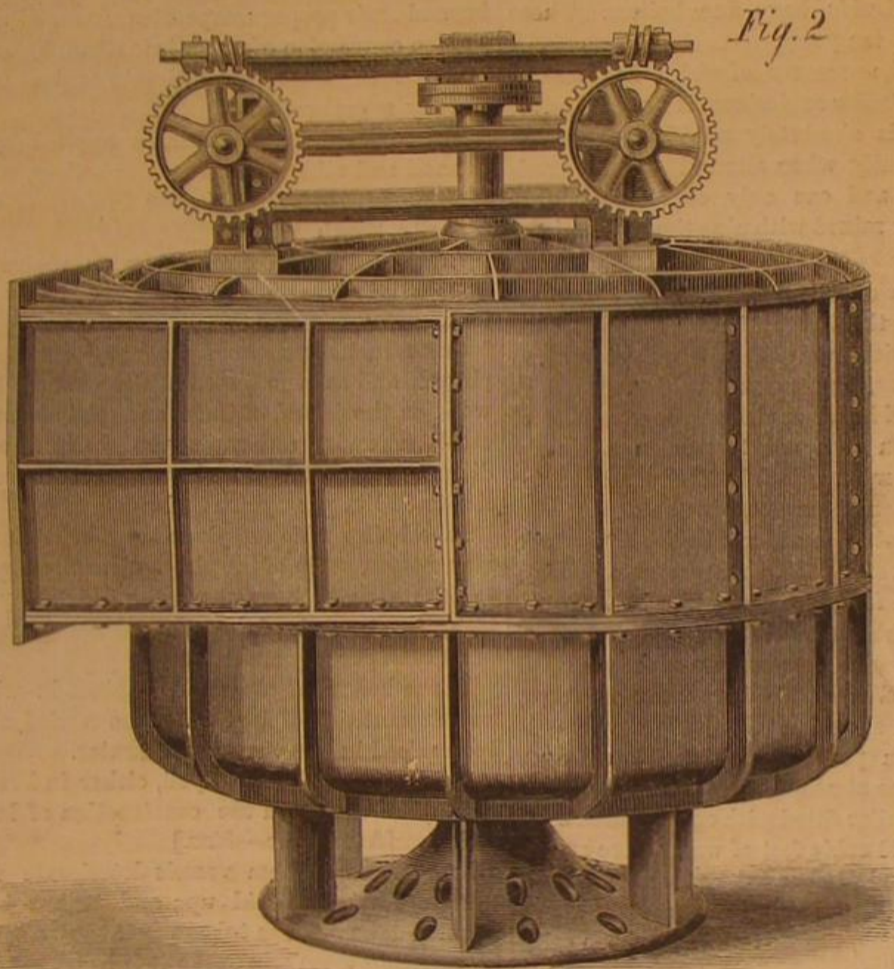
## Improved Turbine Wheel.

Turbine wheels have been made to give out more power, in proportion to the water used, than the best over-shot or breast wheels under any circumstances. The conditions, however, under which those results were obtained, were in every possible way the most favorable. The most indispensable

properly used. Turbines give just as good results under water as out of it. Bucket wheels give good results only out of water. It is claimed that the turbine here illustrated has the most essential advantages of the turbines heretofore designed, and also of the best bucket wheels in use, viz: they will run equally well in or out of water; consequently

other turbine. These wheels are set in iron or wood flumes, according to locality or choice of purchaser. The illustrations show the wheel ready for use, and also the details. The details are as follows:

The perspective views, Figs. 1 and 2, show the external arrangement for raising the gate. This is a worm wheel, A, carried in suitable bearings, work-



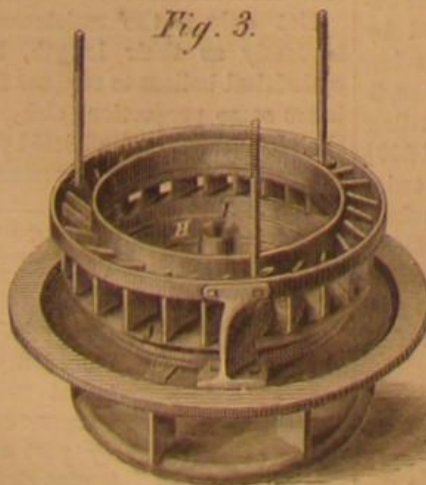
## SWAIN'S TURBINE WHEEL.

conditions are a gate wide open, and a load just adapted to the wheel. In no other way have high results been obtained. If the gate is opened only enough to use one-half the capacity of the wheel, or if by reason of drouth, or a severe frost in winter, the supply of water is reduced in proportion, the power is greatly reduced, and the more the gate is shut the worse the result in proportion to the water used. Hence these wheels are only adapted to constant streams of water. The contrary is the case with bucket wheels, the breast, and over-shot. These motors can be overloaded with work and water, or water without work. Turbines cannot be overloaded with water, though they can be with work. The less water is applied to bucket wheels the more work in proportion. In fact, they are contraries in every thing, except that both give good results, if

back water does not trouble them, except to reduce the head of water. They economize any stream of water, however small, in time of drouth, as well as any bucket wheel ever made. In fact, no advantage can be named in other wheels which is not found

ing a wheel, B, on the shaft of which there is a pinion, C, gearing into a rack, D, on the end of the gate rod, E, which passes through the stuffing box, F. The wheel and gate are contained in the case, G, and are shown in detail in the engravings below

the principal ones. In these, Fig. 3 shows the wheel chamber, H, with the step, I, and gate, J, in place. The latter, it will be seen, surrounds the gate chamber and has 3 guides which keep it straight and true while rising. The wheel and cover are shown in Fig. 4, and the annular space, K, is allowed for the ends of the gate guides to rise into. In Fig. 5, the



in this. It is claimed to be the best made and most durable wheel in the market, and can be regulated with the ease and quickness of a Corliss engine. The step never gets out of order, and it is less liable to obstructions by leaves, or anchor ice, than any

wheel is shown, as also the slots, L, through which the gate guides, L, (Fig. 6) pass; the lower band is removed in order to illustrate the form of the back as nearly as possible.

The operation of the turbine is as follows:—the

flume, A, containing the turbine, is supposed to be kept constantly filled with water, in such mass as to maintain an equal pressure upon all sides, and in every chute of the gate, E. Now turn the wheel, A, to the left, and the gate, E, with guides, G G, will be moved downward, out of and from the slotted chamber, H, thus making a small but perfectly contracted opening all around the wheel; the water thus impinging on the float, Q, at its top edge, and immediately under the upper rim, P, of the wheel, K. Now if this thin stream or streams of water could pass vertically down, after the first impulse, no more power would be taken from the water. To prevent this loss of power the floats, G G, are carried backward so as to receive the water in its downward passage, continually changing its direction from a horizontal to a vertical motion, at the point of leaving the float. It will be perceived that the direction of the floats is very gradually and gently changed from a vertical to nearly a horizontal direction. The direction of the water is changed in the same proportion, in the reverse direction. It will be perceived that, no matter whether the gate is wide open, or only the thickness of paper, there are at all points the same perfection of opening for the water to pass in the wheel. To shut off all water the wheel is turned toward the right, when the gate with its guides is drawn into and against the slotted chamber, with which it forms a water-joint, as perfect as the lathes can make it.

This invention was patented through the Scientific American Patent Agency, May 15, 1860. Further information can be obtained by addressing the Swain Turbine Co., at North Chelmsford, Mass.

#### NOTES ON BOILERS.

The current testimony of those who have employed fans or blowing engines, for promoting combustion in steam engine furnaces, is, that the forced draft causes a considerable waste of coal.

The boilers of the West India Royal Mail steamships, according to the authority of Mr. Pitcher, of Northfleet, last on an average but six years.

The old notion that the three-legged tea-kettle boiled soonest was correct, because the legs conducted heat more rapidly than the plane surface.

The Admiralty marine-engine contracts stipulate for '68 of a square foot of grate and for 18 square feet of heating surface per nominal horse-power.

Gum catechu is extensively used in the United States for removing scale from the interior of locomotive boilers. It is found not to injure the boiler or tubes in the least.

The heat-transmitting power of boiler tubes has been considerably increased by cutting their exterior surfaces into ridges like screw threads.

The boilers of several of the Collins mail steamships had two grates superposed, one above the other, in the same furnace. [So have a dozen other American ships to-day.—EDS. SCI. AM.]

The Giffard injector will commence working, throwing a jet of water into a locomotive boiler, when the pressure of steam is so low as to be incapable of blowing the whistle. It will often start when the steam-gage pointer stands at zero, although, of course, in such case, the gage cannot be correct in its indications. Few high-pressure gages, indeed, can be depended upon, to a pound or so, at the commencement of the scale.

Many American locomotives have iron tube plates  $\frac{1}{8}$ -inch and, in some cases, only  $\frac{1}{16}$ -inch thick at the fire box end, cast-iron ferrules being used. No ferrules are ever used at the smoke-box ends of the tubes in American engines.

Boilers are often worked at a saltiness of four thirty-thirds, or at twice the density commonly regarded as safe.

Feed-water heating apparatus has been suddenly and violently collapsed on the sudden admission of cold water while the exhaust steam was passing through.

Professor Miller has stated that water, entirely deprived of air, may be heated in the open air to 360 deg. before boiling, and that ebullition is then explosive.

The late Mr. J. U. Rastrick once cast some iron cylinders 8 feet in diameter and 8 feet long, wherewith to construct a cast-iron high-pressure steam boiler. After a thunder storm these cylinders

cracked, with a loud report, from end to end. Mr. Rastrick was disposed to attribute this result to the fact that the castings were made, without mixture, from a single brand of iron, and he afterward cast similar cylinders from mixed irons, and with complete success.

The whole ordinary pressure upon all the internal surfaces of a locomotive boiler of the largest class (including the tubes) is about 15,000 tons.

In some experiments recorded in Mr. D. K. Clark's "Recent Practice," it appeared that a single-riveted seam in  $\frac{1}{2}$ -inch plates was only 40 per cent as strong as the whole plate, or 20 per cent as strong as a solid plate 1 inch thick; a similar seam of  $\frac{7}{16}$ -inch plate was 50 per cent as strong as the whole plate, or nearly 22 per cent as strong as a solid plate 1 inch thick, while a similar seam of  $\frac{3}{4}$ -inch iron had 60 per cent of the strength of the whole plate, or 22½ per cent of the strength of a solid 1-inch plate, the  $\frac{3}{4}$ -inch iron, when riveted, being actually stronger than  $\frac{1}{2}$ -inch iron similarly riveted!

Messrs. Beyer, Peacock & Co., frequently weld the longitudinal seams of their locomotive boilers.

The earlier Cunard steamships, with the exception of the *Persia* and *Arabia*, have flue boilers. These boilers have lasted ten years.

Hydrogen gas, the presence of which has been so often suggested in boiler explosions, is not explosive, and, by itself, it is absolutely unflammable. It can only burn silently when allowed to mix gradually with oxygen, and can only explode when it has been previously mixed with nine times its weight of oxygen.

In the experience of the officers of the Manchester Association for the Prevention of Steam Boiler Explosions, one boiler in eight is found to become defective, every year, from corrosion alone.

In several cases of boiler explosion the contents of the boiler have been observed to rise in a cloudy mist, showing the minute subdivision of the water by the disengagement of its contained steam.

Some of the largest boilers in use in the iron works in Staffordshire are vertical, 10 feet in diameter, 30 feet high, and have a 4 feet flue from top to bottom.

The pressure of the air upon the safety valves of steam boilers varies with the pressure of the air upon all other objects. When the barometer is high, therefore, a boiler, of which the safety valve is weighed to a given pressure, will work stronger steam than when the atmospheric pressure is lower.

In a locomotive boiler fitted with one of Baillie's 12-inch safety valves, 80 cubic feet of water were evaporated in one hour, and discharged, as steam, through the safety valve without raising the pressure above 76 lbs. per square inch, the valve having been originally loaded to 64 lbs.

Glass gage tubes for steam boilers are seldom used in the United States. Gage cocks are still relied upon, and occasionally as many as seven are applied at different levels to a locomotive boiler. [An absurd statement; the law requires a glass gage to be on every boiler.—EDS. SCI. AM.]

Iron plates taken from a boiler which had exploded after fifteen years' use have been tested to a strength of 27 tons per square inch.

A remarkable proportion of evaporation to the extent of heating surface employed was reported by Mr. Daniel Gooch, in 1845. The engine *Exion*, having 97 square feet of fire-box surface and 135 tubes, 2-inch diameter and 10 feet 3 inches long, presenting 724 square feet of exterior surface, evaporated 200½ cubic feet of water per hour. This is about twice the usual evaporation per unit of heating surface.

Many of the cylindrical boilers employed in Cornwall weigh one ton for each cubic foot of water evaporated per hour; a boiler working up to 100 indicated horse-power (evaporating 50 cubic feet hourly) weighing 50 tons.

The steam jet was applied by Mr. Goldsworthy Gurney, in 1824, to increase the draft in steamboat chimneys. In 1826, Mr. Gurney applied the jet to increase the draft in the chimney of his road locomotive. Trevithick had discharged the waste steam up the chimney of his locomotive (but not as a jet) as early as 1804.

Boiler scale has been successfully removed in the following manner:—One door of the boiler is taken off. A steam pipe containing highly superheated steam is introduced; the steam acting upon the

saline deposit on the surface of the tubes, and other parts of the boiler, expands and disengages it from the several parts. After this the boiler is again filled with water, and steam got up in the usual manner, and kept up for a few hours, and on afterward blowing off the boilers they are found to be as free from scale as when first made.

A "cup surface boiler," with an ingenious provision for securing the circulation of the water in the cups, was patented by Jacob Perkins in July, 1831. The cups were applied, as was stated, for the purpose of increasing the heating surface.

In the flue plates of American boilers internal flanges are turned on the plate for tubes as small as 5 inches in diameter—a test which only very tough iron would bear.

With large and heavily worked engines there is a disturbance of the pressure in the boiler at every stroke of the piston. A sensitive steam gage will always show this to be the case.

In many cases there is a sudden increase of pressure in steam boilers immediately after starting the engine. This occurs, no doubt, from the ascent of water upon some of the plates which have been heated beyond their proper temperature, as well as from the sudden conversion of water into steam by being raised in a divided state into intimate contact with steam already superheated.

The combustion chamber, as applied by Mr. McConnell and others to locomotive boilers, was patented June 2d, 1846, by Messrs. Stubbs & Grylls, of Llanelly, South Wales.

A boiler, 3 feet in diameter, with plates of  $\frac{3}{4}$ -inch iron, will burst at a pressure of 708 lbs. per square inch.

Cast-iron boilers were formerly extensively employed, and at the present time many boilers at work on the island of Cuba and elsewhere have flat cast-iron ends, although the boilers of 43-inch diameter are worked under a pressure of from 60 lbs. to 80 lbs. per square inch.

In a boiler which exploded at the Atlas Works, Manchester, some of the plates were afterwards found to have a strength no more than  $\frac{1}{2}$  tons per square inch, the strength of the other plates being upward of 20 tons per square inch.

In the boilers of steam fire engines in which only small quantities of feed water are carried, steam has been raised in less than four minutes.

Angle iron is not employed, either in France or in the United States, in the construction of locomotive boilers. [A mistake.—EDS.]

Iron tubes in steam vessels deteriorate very fast when the vessel is laid up; and it has been proposed to take out the tubes when the vessel is taken in, resetting them whenever it is to be got ready for sea.

The seventh division of James Watt's patent of 28th of April, 1784, describes a steam carriage intended probably for common roads. The boiler was to be of wood, strongly hooped to prevent bursting, and having an internal metal vessel containing the fire.

The application of felt to the outside of marine boilers has been sometimes found to accelerate their internal corrosion.

Not only is the resistance of tubes to collapse inversely as their length, but the resistance of cylindrical boilers to rupture from internal pressures bears some proportion, although contrary to that of their length. A cylindrical boiler, when subjected to gradually increasing pressure, yields first at the middle. It is believed by many that the strength of cylindrical boilers would be very considerably increased if hoops were shrunk at intervals around them.

As bearing upon the probability of steam boiler explosions by the admission of water upon heated iron, a simple experiment will show that the heat contained in a given mass of red-hot iron is insufficient to convert any part of its own weight of water into steam. A pint claret bottle may, when filled with cold water, be safely held in the hand while a red-hot poker is thrust into it. If care is taken to keep the hot iron from actual contact with the glass, the bottle will not be cracked, and there will be no disengagement of steam.

It is a somewhat remarkable fact that the boilers of sea-going steam vessels very seldom explode.

Considering their number, their size, their continuous working for many days together, and their liability to incrustations, such boilers might be expected to explode frequently. [It is not at all singular; it is because they are taken care of.—Eds.]

In some of the locomotive boilers made by Mr. Allan, of the Scottish Central Railway, the fire box is a cylindrical continuation of the barrel of the boiler, and is wholly surrounded by a water space with the exception of an opening, like a man-hole, for the admission of air to the internal grate.

Dr. Ernst Alban at one time worked a steam engine, in London, to a pressure of 1,000 lbs. to the square inch.

Steam boilers constructed of wood were at one time employed to some extent.

Professor Rankine estimated the evaporation of water, per pound of coal, in the boilers of the steamer *Thetis* as 13.78 lbs.

In a discussion on steam boilers at the Institution of Mechanical Engineers, Mr. D. Adamson stated that he knew of many boilers 7 feet in diameter working at 100 lbs. pressure, and one of that size was worked at 150 lbs. [How thick were the plates?—Eds.]

The Giffard injector, when supplied with steam of 25 lbs. per square inch from one boiler, has forced water into another boiler against a pressure of 48 lbs. per square inch.—*Engineering*.

#### OUR SPECIAL CORRESPONDENCE.

ORE HILL, SALISBURY, CONN. }  
July 21, 1866. }

*The way the famous Salisbury charcoal iron is mined, and the way it is made.*

Near the western edge of the town of Salisbury, Conn., about one mile from the New York State line, is the Old Bed of hematite iron ore, from which, when smelted with charcoal, iron is made equal in quality to any produced in the world. This excellence is doubtless owing to the absence of sulphur, phosphorus, and other impurities in the ore; and the advantage of charcoal, as a reducing agent, is its freedom from these impurities, which are generally present in mineral coal. The mine resembles a very extensive railroad excavation, excepting that it is crooked and irregular, and the mass of earth which has been drawn out of it is piled in scattered mounds around it. It is about eighty feet in depth, and the town road passes right through it, though not in the deepest part, following the winding cart paths up which the waste earth is drawn. The deposit above is mica slate, in an advanced stage of decomposition, and the ore occurs in seams or beds dipping to the southeast, at an angle of about fifty degrees. The beds range in thickness from that of a knife blade to twenty or twenty-five feet, and the ore is so brittle that most of it may be dug by the pick, though considerable blasting is required. Three-fourths of the labor is expended in removing the superincumbent mica slate and clay, which are hauled up steep paths in one and two-horse carts, and dumped in irregular piles around the sides of the pit. The large lumps of ore are thrown directly into wagons and hauled away to the furnaces, but the small fragments are passed through a washing machine to free them from the earth with which they are mingled.

The washing machine is a revolving cylinder about 4½ feet in diameter and 6 feet in length, formed of cast-iron staves with wrought-iron hoops. Each alternate stave is perforated with quarter-inch holes for the escape of a portion of the water, and all the staves are armed upon the inner side with broad teeth cast on them, and arranged spirally so as to tumble the ore through the cylinder and out at the end opposite to that at which it enters. Water, raised from the bottom of the pit by a steam pump, flows down a steep trough into the cylinder; and into this trough the small fragments of ore are dumped from the carts. The cylinder receives a slow rotary motion from horse-power—three horses being required for the work. The water, with the waste earth, flows from the cylinder through a long trough, at the lower end of which a workman is constantly employed in shoveling away the deposit.

The mine is owned by an incorporated joint-stock company, with a nominal capital of \$40,000, though

its actual value is several times this amount, as the annual revenue is in the neighborhood of \$30,000. The furnace men pay the proprietors \$2 per ton for the ore in the bed; they then pay \$2 75 per ton for digging, and from \$1 upward for hauling, according to their distance from the mine. The mine has been worked for more than a hundred years. The ore at first was transported in leather bags on horse-back to Sheffield, where it was made into wrought iron by the direct process, without passing through the state of cast iron. Mr. Peter P. Everts, the agent of the proprietors, tells me that some of the Salisbury mines make very inferior iron—only this particular bed enjoying the reputation of the very best quality among those who understand the matter. He says also, that this iron—both cast and wrought—shrinks much more in cooling than most qualities, but that the cast iron is less fluid and does not make so sharp castings as some inferior metal.

It is owing to the steepness of the hill sides in this region that charcoal can be used here for smelting iron; the hills, being too steep for cultivation, are given up to the growth of wood, from which the charcoal is made. About a mile from this place is the Phenix Furnace, which is one of the vast and varied possessions of C. T. Maltby, a self-made millionaire, of New Haven. In the neatness and perfection of its arrangements it is a model establishment, and it is supplied with both ore and limestone from a mine and quarry directly by its side. It is 32 feet in height, 9 feet in diameter at the boshes, and 4 feet at the top, built of stone and lined with fire-brick 9 inches in thickness. The "founder," Mr. Horace Harris, is a Massachusetts man, and he was brought up to the trade by his father.

Long before chemists had learned that carbon will, at the proper temperature, take oxygen from any other element, practical iron workers had discovered that by heating iron ore in contact with coal they were able to obtain metallic iron. Hematite is a combination of oxide of iron ( $\text{Fe}_2\text{O}_3$ ) and water, in the proportion of 80 lbs. of oxide of iron to 9 lbs. of water. This combination is a brittle substance, neither malleable nor ductile, nor possessing any of the peculiar properties of metals. The object of smelting is to remove the oxygen and to retain the iron in a pure metallic form. This is effected by heating the ore in contact with some form of carbon, either charcoal, anthracite, or coke. As 1-10,000th part of either phosphorus or sulphur materially impairs the quality of the iron, and as anthracite and coke are rarely, if ever, free from these impurities, the best quality of iron is obtained only by smelting with charcoal.

The process, as practiced at Mr. Maltby's Phenix Furnace, is as follows: The furnace is first filled with charcoal, which is set on fire. Then a charge of ore and limestone is introduced at the top. As the coal is burned out the charges are renewed, from 40 to 45 being introduced in the course of 24 hours. Each charge consists of 25 bushels of coal, 200 lbs. of limestone, and from 1,200 to 1,500 lbs. of ore. The quantity of ore is varied to adjust the temperature, as on this depends the hardness of the iron produced. The ore gives up its oxygen, which combines with the carbon of the coal, forming carbonic acid—a gas that floats away in the atmosphere. At the same time the iron absorbs a small quantity of carbon, becoming, by this process, cast iron, with a melting point far below that of pure iron. The hotter the furnace the smaller is the quantity of carbon absorbed, and the softer is the cast iron produced. The iron is numbered from 1 to 6, according to its hardness, with an intermediate half number between 4 and 5. This intermediate number, 4½, is suitable for car wheels.

The fire is urged by a powerful blast of hot air, the air being heated by the waste heat in the top of the furnace; the waste heat is also used for generating steam for driving the blowers. The blowers are two wooden cylinders, furnished with pistons like those of steam-engine cylinders. These cylinders are each 5 feet in diameter, with 5-foot stroke. They are formed of inch plank sawed out in pieces like felloes, and are lined with veneering, the grain of which is laid longitudinally. The heads are of cast iron, and they are held together by iron bolts extending from one to the other, outside the cylinder. These cylinders are laid horizontally, and to

prevent the weight of the piston from wearing them on the lower side, the piston rod is extended through the head and supported by a yoke running in greased ways. These wooden cylinders have been in use 13 years, and are still in good condition, but Mr. Harris thinks iron is much the most suitable material for this use. To prevent the force of the blast from varying with the varying velocity of every stroke, the air is blown into a regulator, which is simply a cylinder like those of the blowers, set upright, and with the upper head loose like a piston, and loaded to the requisite pressure. The pressure of the blast is about 1½ pounds to the square inch; it is measured by a siphon gage placed in plain sight of the engineer.

The air is heated after it leaves the blowers by passing through a series of cast-iron pipes, of siphon form, set in the furnace chimney above the point at which the coal, ore, and lime are introduced. The temperature desired is about 600 deg., and the founder at this furnace employs two tests to measure the temperature. As lead melts at 612 deg. this affords a convenient test for that temperature; and a still more convenient is the kindling of a stick of pine wood. Mr. Harris says that he does not suppose, in still air, a stick of pine would take fire at 600 deg., but, in the powerful blast from these tweers, he was taught by his father to regard it as a trustworthy test.

The furnace is kept in constant operation night and day, and once in eight hours it is tapped at the bottom, and the molten metal is drawn out and run into pigs—from 3 to 3½ tons of iron being obtained at a casting. The present price of the best Salisbury iron is \$70 per ton. Mr. Maltby is holding heavy stocks of cast iron—variously stated at from \$150,000 to \$300,000 worth—and it is said that most of the furnace men in the region are also holding largely in hopes of still higher prices, notwithstanding the inflated condition of the currency.

The lime used in smelting iron is employed as a flux. It combines with the silica of the iron ore, forming a silicate which is fusible at the temperature of the furnace, and which consequently melts and runs out of the way, thus allowing the several globules of molten iron to run together and flow down to the bottom of the furnace. Innumerable other chemical changes go on in the interior of a smelting furnace, among the many impurities of iron ore with the fuel and flux, at the high temperature that obtains, but those stated are the principal and essential ones. G. B.

#### Casting of a Twenty-inch Cannon.

Another twenty-inch gun was recently cast at the Fort Pitt Iron Works, Pittsburg, Pa., being the third one of that size. This is the first naval gun, however, and is intended for the *Puritan*, consort of the *Dictator*, both ocean monitors. The two previously cast were army guns. They are Rodman guns, that is, cast with a water-cooled core.

The quantity of metal melted at once was enormous; not less than 140,000 pounds, and three furnaces were in use to accomplish it in time, the fires being started at 4.30 A. M. on the morning of pouring. The iron was in the following proportion: 101,000 Juniata, second fusion; 39,000 Juniata pig, from the Bloomfield Furnace; this is stated to be the finest quality of metal, for gun founding, in the country. The furnaces were tapped at 12.10, and the mold was filled in a short time.

The length of the rough casting is 236 inches. The maximum diameter is 65½ inches, and the minimum 48 inches. When finished, the breech of the gun will measure 64 inches in diameter, and the nozzle 35½ inches. The length of the cylinder bore is 147 inches, depth of chamber 10 inches. The thickness of metal outside the bore, at the breech, is 23 inches, and at the nozzle 7 9-10 inches. Diameter of trunnion 18 inches. At 9.20 Sunday morning the water was turned off, at which the temperature was 97 deg. The core barrel was hoisted, when it came out perfectly clean, there being every indication of perfect success in the casting. After the barrel was hoisted out, a very small stream of water was allowed to flow into the bore, when it immediately became steam. This was to be continued until 8 o'clock, when a column of cold air would be forced in, and the cooling process completed in this way.

## FOREIGN SCIENTIFIC NEWS.

(From our own Correspondent.)

LONDON, Friday, July 20, 1866.

The *Great Eastern*, with the Atlantic cable on board, had, up to last night, laid 811.14 miles of the line, and the position of the ship is given as lat. 51 54 N., long. 29 39 W., and 712.9 miles from Valentia. Signals good.

At Valentia, and at Heart's Content, in Newfoundland, stations have been erected by the Atlantic Telegraph Company, with a pillar of solid masonry in the center of each. These pillars are to support the receiving instruments—Professor Thomson's reflecting galvanometers—which are now made so sensitive that the mirror and magnet together weigh but three grains, and it is therefore necessary to place the apparatus where it will be safe from the slightest vibration. To secure the cable from the effects of lightning, the contact with the earth will be made several miles out at sea, by means of a length of old cable with a lump of lead cast on the further end, which will be laid from each telegraph station, and the conducting wire used as an earth line. The instruments for sending messages through the cable were recently invented by Mr. Cromwell F. Varley, and Professor William Thomson. The apparatus is the result of a long series of investigations to determine the laws which govern the passage of currents of electricity through long cables, and the method adopted is to send no less than five weak currents of varying length into the cable at one end to produce one single deflection of the needle at the other. The time of each pulsation is carefully calculated in accordance with known laws, and the result is, that one signal having been sent, the cable is left at once in nearly a neutral state, so as to be ready for the immediate transmission of another. Professor Thomson accompanies the expedition as consulting electrician, and is only to be appealed to in moments of difficulty. The signals between the ship and shore will remain in the hands of Mr. W. Smith, who, as electrician to the manufacturers, has necessarily gained much experience in laying cables. Mr. C. F. Varley, one of the cleverest electricians in this country, who, for many years, has had charge of the wires of the largest telegraph company in England, also acts as consulting electrician, but is separated from his colleague, Professor Thomson, to watch the signals from Valentia, and to test the line should faults occur. Mr. Cyrus Field is on board the *Great Eastern*, but nobody else of importance. The rest of the expedition consists of the crew and officers, the staff of the contractors, and two or three of the directors. These directors, or their colleagues, made the expedition a private one, and last year sent the American reporters back from London to New York, without any apology for the trouble and the time they had wasted in the attempt to obtain a passage in the *Great Eastern*. General ungentlemanly behavior and the secrecy hanging over the operations of the company, have, in this country, caused much coolness respecting what in itself is a noble undertaking. The shares of all the companies connected with the undertaking are still at a discount in the London market. Out of the 9,000 miles of deep-sea cables that have been laid, less than 850 are at work, and some of these are faulty. Shallow-sea cables are continually breaking and undergoing repairs, and for this reason the prospect of maintaining an Atlantic cable in working order is not very bright. The North Atlantic route is again attracting attention here. A company is in existence, intending, if possible, to carry out the scheme, but the names of the directors have not yet been published.

Mr. Balfour Stewart, F.R.S., Superintendent of the Observatory of the British Association at Kew, is now conducting a series of curious experiments. A disk, when made to rotate rapidly in vacuo, becomes slightly heated, as proved by the aid of a thermoelectric pile connected with a reflecting galvanometer. By very ingenious apparatus, he causes a disk of aluminum to rotate rapidly in vacuo, and so eliminates all sources of error as to prove that the heating arises from some causes as yet unknown to men of science. He believes that he has at last brought the hypothetical substance, ether, within the range of direct experiment, and that the heating effect arises in some way from its vibrations.

A large body of archaeologists have this week in-

vaded London to rummage all its old buildings, charters, and antiquities. The Lord Mayor, as chief magistrate of the city, received them with open arms, and the Queen has given them permission to explore Windsor Castle to-morrow from turret to basement. Last Wednesday they visited Waltham Abbey, a building whose origin is lost in the mists of ages. Legends tell how, in the time of King Canute, a country gentleman, who rejoiced in the unromantic name of "Tovey," and was known to his neighbors as "Tovey the Proud," had a miraculous cross dug up on his estates in Somersetshire. The cross was placed on a cart, to which were yoked four oxen, and then the sacred relic was asked if it would like to be taken to Glastonbury or Canterbury. It made no sign, till Tovey chanced to mention Waltham, where he had estates, and directly the name was spoken, off trotted the oxen. So was the Holy Rood first established at Waltham. The surrounding country was wild forest, but Tovey proved himself a root and branch reformer, for having founded his church he established a parish also, by planting fifty families upon the spot to worship therein. King Harold, in 1062, built an abbey upon Tovey's foundation, and established therein a dean and twelve secular canons. Portions of Harold's work are still visible. In later years he died, and was buried within the walls of the now venerable minster.

On Wednesday also, Sir John Lubbock, Bart., gave an inaugural address to the Archaeological Institute, on "The Study of Primæval Archaeology." In Western Europe he recognized four distinct pre-historic periods, namely, Palæolithic or Early Stone Age; the Neolithic or Later Stone; the Bronze Age, and the Age of Iron. Of the earliest of these periods he said that its antiquities are found in beds of gravel or loam, which extend along our valleys, and reach sometimes 200 feet above the present water level. These beds were deposited by the existing rivers, which, moreover, drained the same areas as at present. The fauna of that period comprised other than animals now existing—for instance, the mammoth, the woolly-haired rhinoceros, the hippopotamus major, and the musk ox, then lived. The climate was much colder than at present, yet man, he said, already inhabited Western Europe, and used rough implements of stone, none of which were polished. Pottery and the use of metals were unknown. The people could draw, and the representation of a mammoth on a plate of fossil ivory, found by M. Lartet at La Madelaine, and was exhibited as a specimen. Sir John Lubbock is President of the Entomological Society, Vice-President of the Ethnological and Linnæan Societies, and a Fellow of the Royal, the Geological, and the Society of Antiquaries.

## Photography and the Kaleidoscope.

About a couple of years ago, a writer in an excellent transatlantic cotemporary, the SCIENTIFIC AMERICAN, remarked, "Let the photographer once combine the kaleidoscope with the camera, and then see with what ease and rapidity he can produce the most charming designs for dress goods, tapestry, oil-cloth, wall-paper, and numerous other purposes. Such a thing is possible." Almost at the same moment that the American writer stated this, M. l'Abbé Laborde brought under the attention of the French Photographic Society a method which he had adopted to effect the preservation, by photography, of the changeable designs of the kaleidoscope. As a means of preserving patterns for a variety of decorative purposes, this application of photography is deserving of attention, and it may be interesting here to quote from the communication of M. l'Abbé Laborde on the subject. It is worthy of remark, that the method of throwing the designs of the kaleidoscope on a screen by the aid of the magic lantern has since been adopted and exhibited at the Polytechnic Institution:—

"The variety of designs presented by the kaleidoscope, when turned round, is familiarly known to every one, yet we are often surprised at the appearance of very curious and unexpected forms which we see disappear with regret.

"The regular figures which result are depicted on the ground glass of the camera of long focus, and the images are focussed direct without being reflect-

ed; this portion is naturally more lighted than the others. It requires several minutes of exposure to obtain a picture on the collodion plate. We cannot focus the portions of the image which are several times reflected, for they appear in the objective as if they came from greater distance—they lack distinctness, and they also exhibit the defect of planitude in the mirrors.

"Notwithstanding these imperfections, I believe I have attained the aim I proposed to myself, which is, to place before the eyes of those who are occupied with stained glass, paper hangings, and other kinds of ornamentation, very varied patterns, which photography can supply by the hundred.

"I cannot pass over in silence another application of this instrument, although it is in some measure foreign to photography. On the surface of a disk of glass I glue a host of black objects, such as paper patterns, small leaves, mosses, lichens, etc., and place them as near as possible to the external end of the kaleidoscope and, by a mechanism which it is unnecessary to describe, I make the disk turn slowly, and thus present them successively to the inclined mirrors; we then perceive a series of changing figures depicted upon the ground glass, among which we can select those best suited to be fixed by photography.

"In a room completely darkened, we can project the images upon a stretched canvas, which will admit of their being seen by many persons at the same time. We must then bring the kaleidoscope nearer to the objective, in order to increase the dimensions and distance of the images, and illuminate the disk by a strong light; in a word, it is a magic lantern, in which we replace the painted slides by a kaleidoscope. If, instead of objects glued upon the glass, we apply various tints mingled, and thrown haphazard upon the surface of the disk, the figures receive the colors, and their unexpected evolutions are very pleasing to the sight."—*Photographic News*.

## Photographing a Volcano.

Among the most interesting of the contributions at the recent exhibition soirée of the London Photographic Society were some cabinet pictures, by Mr. Moens, of recent eruptions of Etna, taken so near the spot that the tripod had to be more than once hastily removed to escape the flow of the burning lava. Views of the new volcanic islands, which have lately risen in the Grecian Archipelago, were also presented.

## The Prussian Army.

A letter from a gentleman in Stettin, Prussia, to a relative in Mobile, Alabama, states that: "We have now ten army corps, including the Guards. Each corps has ten regiments of infantry of the line, and each of these regiments consists of three battalions of 1,013 men each, amounting to 308,900. To these add ten regiments (Landwehr) of reserves of the first call, and ten of the reserves of the second call, for each army corps—amounting to 607,800 men—and we have a total of 916,700 infantry.

"For artillery, cavalry, chasseurs, sharpshooters, pioneers, etc., add one-third of the above, and we have a grand total of 1,215,600 men, all good soldiers."

If these estimates are correct, the Prussians have a much larger force than has been generally believed in this country, and it must be considered that this vast army is not composed of undisciplined conscripts, but of well drilled and efficient soldiers.

## Power of Lightning.

While on a visit a few days since to the old town of Litchfield, Conn., we were shown, in the outskirts of the village, an example of the power of lightning.

Near the roadside, in an open pasture, once stood a fine old chestnut tree. It was about as large as such trees ordinarily grow. A few days since a bolt of lightning shot down through its branches, riving the tree into thousands of pieces and scattering them in a circle at a considerable distance from the trunk, of which but a small stump remained. We have frequently seen trees that had been struck by lightning, but never before saw one so completely riddled to pieces. During the past few weeks we have reports of several houses furnished with rods, that were struck and badly damaged.

## THUNDER STORMS--PROTECTION AGAINST LIGHTNING.

The present summer, so far, has been remarkable for the number of accidents from discharges of electricity. We believe there has been no storm this season, accompanied with lightning, which has not resulted in damage to person or property. In view of these facts, the importance of providing adequate protection to buildings and ships, from lightning, can hardly be over-estimated. The failure of lightning rods, in some instances, to protect the structure to which they were attached, has had the effect to impair confidence in such means of protection; but it can be clearly demonstrated that when made on scientific principles, honestly constructed, and properly applied, they are the only means which can be relied upon for protection, and that they are deserving of entire confidence.

The electric fluid does not always descend in a vertical path, nor in a course approaching that direction. Many instances are on record where the bolt traveled horizontally, and much damage has occurred from "earth strokes" or ascending discharges. These facts have not always been recognized by constructors of lightning rods, their idea being that a building was sufficiently insured against lightning by having the rods project above the highest portion of the building, leaving all the other parts unprotected. Experience has added its evidence to the instructions of science in demonstrating the unreliability of such protectors.

From Lyon's "Treatise on Lightning Conductors," we copy the following requisites of a good rod:—

"First. The conductor should be made of good conducting substance.

"Second. It should have great electrical capacities; a square rod requires less metal than a round rod.

"Third. It should be perfectly continuous, *i. e.*, it should have no breaks in the connections—no links or hooks, but a perfect metallic union of every part.

"Fourth. It should be insulated from the building to be protected, except from such masses of metal as are likely to offer other lines of discharge.

"Fifth. It should have numerous lateral points, one in six or seven feet will answer. The more numerous these points are, the greater the conducting power of the rod. Besides, these lateral points provide for an oblique discharge, each being as good a receiving point as the higher point at the chimney or other prominences. They also guard against a lateral explosion, or a division of the charge, which is liable to happen in case the rod is overcharged, especially if it be fastened to the house with pointed staples; and in case of an upward stroke, the electric fluid being discharged at so many different points, no harm can possibly occur.

"Sixth. Its upper extremity should project freely into the air, should be pointed, and may be triangular, somewhat similar to a bayonet, or it may have several branches. The only scientific advantage in having a branching head or point for the superior termination, is this: all points are not likely to become blunt at the same time. Some have supposed that the point should be magnetized; and little needles, called "*magnets*," have sometimes been added. But it is difficult to see the practicability of this recent discovery; for most are aware that magnetized iron or steel soon loses its magnetic influence. But is there any truth or science in this application of magnetism? If there is, we confess that we have not been able to discover it in any experiments in the laboratory; neither can we learn that the subject has even been mentioned by any writer *whatsoever*, on the subject of electricity.

"Seventh. The upper termination should be plated with silver or gold, to prevent corrosion.

"Eighth. Every branch rod running to chimneys, and other prominences, should have a perfect metallic union with the main rod.

"Ninth. In cases where metallic vane spindles, or other points exist, the conductor may commence from these, and should be applied immediately to the part to be protected, and not at a distance from it; and should be so applied that a discharge of lightning falling on the general mass could not possibly find its way to the ground through the building by any circuit of which the conductor did not form a part; that is to say, the conductor should be so carried over the several parts of the building,

that the discharge could not fall upon it without being transmitted safely by the conductor. Hence, the rod should run along the whole length of the ridge, and down to the ground, at least on two sides of the building. If the building is large, it should run down on each corner.

"Tenth. Every conductor running to the ground should terminate sufficiently beneath the surface to insure moisture in the driest part of the season. If circumstances permit, it should connect with a spring of water, a drain, or some other conducting channel."

Numerous instances of the ascending stroke have occurred, the records of which are extant. It must be evident that a single rod extending above only one point of the building, will not properly protect the structure to which it is applied from one of these upward strokes, neither is it efficient against an oblique or divided discharge. The whole building, top and sides, must be protected by a continuous rod with numerous projecting points for receiving and discharging the electric fluid. In the summer of 1787, lightning struck two persons near the village of Tacon, in Beaujolais, who had taken refuge under a tree. Their hair was driven upward and found near the top of the tree. A ring of iron which was on the shoe of one of these persons was found suspended on one of the upper branches.

On the 29th of August, 1808, lightning struck a small building near the hospital of Salpêtrière, Paris. A laborer who was in it was killed, and after the event, pieces of his hat were found incrustated in the ceiling of the room.

In June, 1854, the dwelling of A. J. Platt, of Deep River, Conn., was struck by lightning, the fluid passing up the door-casing of the hall, knocking off the ceiling in the hall and parlor, and, after traversing the house longitudinally, passing down a pillar, returned to the earth. This building was guarded by a rod attached to each chimney, the branches connected to a single rod passing down the side of the building through glass insulators. In this case it appears that the elevated rod afforded no protection against an upward stroke. The case would probably have been different if the sides of the building had been furnished with conductors with lateral points. Passing the rod through glass insulators does not seem to be always effectual to protect the building. The interposition of a glass knob between the rod and the building, appears to be preferable. In cases where the rod has passed through a hollow cylinder of glass, it has been found that the glass would burst and the fluid enter the building by the iron staple which held the glass ring.

Some of the old-fashioned and erroneous notions entertained and religiously believed by persons in relation to the effects of lightning, and particularly the means of protection, have been exploded by the occurrences of this season. That feathers afford no protection against electricity, is proved by the case of a woman in St. Louis, who was killed by a stroke of lightning while lying on a feather bed. An instance of one of three persons sitting near a closed window, also dispels the illusion that the interposition of window glass is an effectual bar to the action of the destructive element.

The only efficient protection is that of a good rod properly put up. The subject is too important to be lightly passed over, and it is no less important that the confidence of the purchaser should not be betrayed, and life and property endangered, by accepting an inefficient conductor, or one improperly applied.

A LITTLE daughter of Mr. Kennedy, residing in Pittsburg, came near losing her life the other day, by eating a small piece of fly-poisoning paper. Sweet milk was at once administered as an emetic. It had the desired effect, and a physician summoned declared that the child owed its life to this simple remedy.

[White of egg is also beneficial; being an antidote to most poisons.—Eds.]

ORDERS have been received at the Springfield Armory, from the Ordnance Department, at Washington, for the manufacture of 25,000 of Allin's lately improved breech-loader, and work on them will soon be commenced.



## Breech-Loaders Vs. Muzzle-Loading Fire-arms.

MESSRS. EDITORS:—The great success of the needle gun, in the hands of Prussian soldiers, has awakened a lively interest in favor of breech-loading fire-arms in Europe and in this country.

Inventors and practical armorers have, for years past, been fully aware of the great superiority of the breech-loading system over that of muzzle-loading, and great efforts have been made to introduce this class of arms into the military service of the different nations of Europe and in this country. To Prussia belongs the credit of first arming its infantry with this class of arms. Better guns, however, than the needle gun, are to be found in the United States. Why they have not been adopted by the Government ere this, is a subject which need not be discussed at this time. The object of the writer is to point out some of the advantages of breech-loading over muzzle-loading arms.

First, A breech-loading carbine, or musket, when metallic cartridges are used, can be loaded and fired a thousand times without cleaning, when it is scarcely possible to load and fire a muzzle-loading musket fifty times without cleaning. This difference grows out of the fact that the principal fouling caused from each discharge of a breech loading arm, is deposited within the cartridge shell, or case, which being removed at each discharge, keeps the gun clean. If a man will take the trouble to load and fire a muzzle-loading gun, say a Springfield musket, fifty times, and then remove the breech-pin, he will find a deposit of burnt powder at the breech where the charge lay, of about one-sixteenth of an inch in thickness. This incrustation is very hard and difficult to be removed. There is none of this deposit at the breech of a breech-loading arm, for the reason as stated; the fouling engendered at each discharge is removed with the spent cartridge case. When a ramrod is used, the fouling is rammed home toward the breech; when in the breech-loading arm what little there is of deposit in and along the barrel, not removed with the case, as stated, is carried forward and out of the gun by each successive discharge.

Second, Greater penetration and range can be had from a breech-loader with same charge, than can be obtained from a muzzle-loader. This favorable result grows out of the fact that in a breech-loading arm, when used with a metallic cartridge, there is no escape of gas at the breech, all the force of the powder being expended in giving velocity to the ball, when in a muzzle-loading arm, there is an escape of gas at the vent at each discharge, which lessens the initial velocity of the ball.

Third, A consideration of the very first importance in favor of breech-loading fire-arms is, that every cartridge must be either discharged or withdrawn from the barrel, precluding the possibility of such results as were shown on the battle field at Gettysburg, where, of the 27,574 muzzle-loading muskets collected after the battle, 24,000, were found loaded; 12,000 of which contained two loads, and 6,000 or 20 per cent were charged with from three to ten loads each, the cartridges often times being loaded without breaking them, and many inserted with the ball downward. What an immense amount of effective force was here rendered useless, and that, too, in the heat of battle when every available means was being exerted to secure victory! What might have been the gain, in the saving of life and of treasure to the nation, had the Union soldiers been armed at the commencement of the rebellion with such arms as the Spencer, Sharpe Remington, Lately or Peabody breech-loading rifles. With such arms in the hands of the Union soldiers it is but reasonable to suppose that the rebellion would have been crushed within six months from its commencement. It is results that count in warfare. Nothing can be more plain than that those who have the best arms necessarily have a great advantage. It is, therefore, the duty of every nation to prepare in

time of peace, for its own defence, and to do so effectually, it should avail itself of any ascertained improvement as soon as possible.

Fourth, There is still another very important feature in favor of the breech-loading system: viz, the practicability of loading and firing with great rapidity. The Gatling gun, which is a breech-loader, can be loaded and fired at the rate of one hundred shots per minute. Now it is evident that no muzzle-loading arm could be loaded and fired so often. By loading at the breech, the process of loading is simplified—ramrods, wipers, the biting of cartridges, capping, etc.—are all dispensed with.

The prediction may be safely made, that muzzle-loading small arms will, within the next quarter of a century, become as obsolete as the flint-lock musket is at the present time.

Breech-loading cannon will, no doubt, in most cases, supersede muzzle-loaders. There is now at the Arsenal, in this city, a breech-loading steel cannon—Broadwell's patent—which has been adopted by the Russian and other Governments of Europe, which can be loaded with great facility, and which has been fired over one thousand times without the escape of gas at the breech, and without injury to the gun. Surely these improvements and results should wake up "red tape" and "old fogysm" to a sense of their duty. There is no necessity for riding in stage coaches when steam cars are at hand.

Washington, D. C., July 26, 1866.

#### Board Measure.

MESSEES. EDITORS:—Your correspondent, Mr. P. Rhoades, under date of June 10th, after correctly noticing the error in Heber Wells's mode of calculating the quantity of one-inch boards that can be sawed from a log of any given size, gives his mode of calculating the same, viz., "multiply the length of the log, in feet, by half the diameter less 4 inches, and the product by the same number, then divide by 4, and the product will be the amount in 1-inch boards;" but he also says, although the result is correct, he does not know how or why it is so, or in other words, he does not know why he deducts 4 from the diameter of the log, or why he divides by 4. Now by cancellation, the length of the log—in feet—after being squared by taking off the 4 inches, is multiplied by half its diameter in inches and then again by the same number, which is the same as multiplying the length by the square of half the diameter; now, as the square of half the diameter is only one-fourth the square of the diameter, it only requires dividing by 3 instead of 12 to bring it into feet, solid measure, or by 4, as done by Mr. Rhoades, if an allowance is made of one-fourth for saw kerf.

On the same principle of cancellation, Mr. Rhoades would save still more figuring by multiplying the length of the squared log in feet, by the square of one-fourth its diameter, in inches, and dispense with dividing by 4 altogether. This rule will apply to any length log, or a log of any size square, viz., one log 12 feet long, 24 inches in diameter, deduct 4 inches for slabs, and you have a log 20 inches square. The contents will be in 1-inch boards, 300 feet, thus:  $12 \text{ feet} \times 24 - 4 = 20 \div \frac{1}{4} = 5 \times 12 = 60 \times 5 = 300$ . But Mr. Rhoades makes a great mistake in taking off 4 inches, indiscriminately, from logs of different sizes, as a 12-inch log is squared by taking off  $1\frac{1}{2}$  inch slabs, while a 24-inch log requires a slab of  $3\frac{1}{2}$  inches, which leaves a log of 17 inches square. My calculation is made from Mr. Rhoades's estimate, and is intended only to show where he gets the 4 for a divisor.

I have read the remarks of D. W. C. C., in the last number of the SCIENTIFIC AMERICAN, and consider them mathematically correct.

AN OLD LUMBER MEASURER.

Madison, Ind., July 27, 1866.

#### The Mississippi Levees.

MESSEES. EDITORS:—I see that the levees near New Orleans are causing a great deal of trouble and expense. Why not build them of two rows of piles, laid nicely edge to edge, with a space between, and have them driven to or through the "hard pan." If there is no natural "hard pan" make an artificial one of hydraulic cement grout. Excavate the space between the two rows of piles down to the "hard

pan" and fill with a mixture of clay and gravel, well worked together, with a proper quantity of liquid oxide of iron. Proportions, one of clay to two of gravel. Line the piles from the top down two or three feet with plank, to hold them together and stiffen the structure.

Gravel, clay, and timber are on the spot, and the iron scraps, from which to make the liquid oxide, can be brought from all parts of the country, as ballast, in vessels arriving in New Orleans. It could be put into tanks, as wanted, with water and a little acid. If the iron chips could not be easily procured, the mixture of clay, gravel, and water would answer every purpose, except that it would require more time to harden than when mixed with liquid oxide. In such a case I would brace the outside by wood-work, or a grout of hydraulic cement, and by the time the piles were rotted away the mixture would have become a compact, hard body. A mass of clay as a brace on the water and land sides would make all secure. Even common earth laid at an angle of thirty or forty-five degrees would make an efficient protection.

The danger in all such embankments is the first insidious advances of the water, but I think a muskrat would find it hard to make a hole through this embankment.

A. J. WILKINSON.

Pawtucket, R. I.

#### Hail Storm Phenomenon.

MESSEES. EDITORS:—The village of Portchester, N. Y., was visited by a remarkable hail storm on the afternoon of the 26th. At about three o'clock icy balls, averaging nine inches in circumference, came pouring or dropping down with terrific effect upon the crops—stripping trees, breaking windows and skylights, and developing phrenological bumps of extraordinary altitude upon heads before innocent of such elevations.

The storm lasted half an hour, and was confined within an area of four miles, beyond which limit it was not felt. An enterprising hotel keeper in the village, with a view to profit, and knowing that everything was sent into this world for some good purpose, collected several baskets full of the frozen balls and used them at his bar as a substitute for ice. For a time "hailstone punches" were a favorite beverage, and many who imbibed of them attest the excellent qualities of the drink.

McN.

New York, July 30, 1866.

#### An Unbeliever in Breech-loading Fire-arms.

MESSEES. EDITORS:—A correspondent, in your issue of July 14th, writing under the heading of "Breech-loading Rifles," claims to have some wonderful targets made at 50, 100, and 220 yards. Now, if good shooting can be made by a breech-loader in a favorable time (which I do not believe), then we had better discard all muzzle-loaders, and for the best performances use breech-loaders.

I have used the muzzle-loading rifle for forty years for hunting and prizes, and am firm in the belief that there is no breech-loader that can or ever will be able to compete with a good muzzle-loader, either at target or for hunting, for the reason that the bullet cannot be patched in the breech-loader.

The targets referred to by your correspondent are probably selections from five or six thousand targets. Now, I would like to know if your correspondent can, in a favorable time, make ten shots at fifty yards in a one-inch circle; for we hunters do not reckon it any thing unless we can go out any fair day and do it. I have seen the center nail driven in four times in succession at forty rods, but the man that will buy that gun for the purpose of driving the center at 40 rods, will be mistaken. I hope your correspondent will tell us what he can do with his breech-loader one day with another, then we can judge if it is better than a muzzle-loader. We are all seeking light and information.

A. A. H.,

A Rocky Mountain Hunter from 1840 to 1848.  
Syracuse, N. Y., July 22, 1866.

#### Millers Please Notice.

MESSEES. EDITORS:—I have a few questions to ask through your valuable paper—which I take to inform myself on things mechanical.

Can good flour be made with a "stiff spindle burr?" Does it equal or surpass the old style "cock

head" in either durability, ease of management or quality of work?

We would like information from some unprejudiced and uninterested party who has tried both, or can speak confidently from practical or scientific reasons.

Z. W. WOOD.

Goodland, Ind., July 17, 1866.

#### NEW INVENTIONS.

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

TALLOW OIL.—H. R. Colburn, Boston, Mass.—This invention relates to a compound of tallow oil with coal, shale, or heavy paraffine oil, whereby the best properties of each are retained, and the ingredients are so combined that they are not liable to separate, the tallow oil itself giving it substance and durability, and the property of adhering to the machinery when it is used for lubricating purposes.

TRUSS.—CHARLES WESLEY THOMPSON, Batavia, Ill.—This invention consists principally in making the pad in two distinct pieces of wood or other material, placed side by side, so that their action in holding a hernia is like that of two fingers of the hand.

STEERING APPARATUS.—EDWARD ROWSE, Augusta, Me.—This invention relates to certain improvements in that class of steering apparatus in which wheel ropes or tackle are used, in connection with a tiller and hand-wheel windlass, and whereby the wheel ropes are kept taut at all parts of the stroke of the tiller, and the main objection to wheel ropes or tackle thereby obviated.

CHURN DASHER.—GEORGE DECKMAN, Malvern, Ohio.—This invention consists of an improved dasher formed by the combination of a double concave and concavo-convex perforated disk with each other and with the dasher handle.

SORGHUM STRIPPER.—C. L. HART, Mattoon, Ill.—This invention consists in the use of a plate, having holes formed through it, through which the stalks are passed to be stripped—the holes are circular at the inner side or face of the plate, and polygonal at the outer side or face of the said plate; in the combination of the frame and spring bars, and with each other, and with the perforated plate, and in the combination of stripping tubes with the spring bars and with the perforated plate.

MANUFACTURE OF IRON.—JONATHAN M. JONES, East Taunton, Mass., BERNARD SPAULDING, Port Richmond, N. Y., SYLVESTER PARKINS, Providence, R. I.—The object of this invention is to furnish sheet and bar iron, tougher, more flexible, not so liable to rust, and which, when rolled into sheets, will make and take a finer polish than the ordinary iron, and be equal or superior to the best imported iron in all the qualities that make iron valuable.

RESCUTTING FILES.—A. A. DUNK, Manchester, N. H.—This invention consists in a new process of recutting and renewing worn files, and such as are badly cut and damaged, so as to make them again serviceable.

TRACE BUCKLE.—R. J. ALGEO, Kalamazoo, Mich.—This invention has for its object to furnish a trace buckle in which the trace can be readily taken up or let out, which does not require to be punched, and thereby weakened, and which will adjust itself to a trace of any thickness, and it consists in making the frame of the trace buckle with slots or elongated holes in its sides, and in the same tug cap in combination with the said slotted frame of the buckle.

BROOM.—E. P. COOLEY, New York City.—By this invention simplicity, cheapness, and durability are obtained.

WASHING MACHINE.—A. L. DRAKE, Richmond, Me.—This invention relates to a clothes washing machine of that class in which a reciprocating rubber is employed, and it consists in a novel manner of operating the same and graduating the pressure thereof, whereby the clothes will be subjected to a requisite degree of rubbing to thoroughly cleanse them, and without injuring them in the least.

PORTABLE SHAVING CASE.—THOMAS P. CONARD, West Grove, Pa.—This invention consists in combining with a shaving box a water-heating apparatus; and also in so arranging the water-heating apparatus within the shaving case that water can be heated in it without occasioning the least injury to the case.

CLOTHES-WASHING MACHINE.—WILLIAM GOWEN, Warsaw, Wis.—This invention consists in a novel manner of securing the cross bar, which supports the rubber shaft in the tub, whereby it may be readily adjusted in and detached from the tub, so that there will be no difficulty in removing the rubber whenever required. Also in a peculiar way of arranging the cleats on the rubber and on the bottom of the tub, whereby the clothes are operated upon in a very efficient manner.

COVERING FOR STEAM PIPES, ETC.—E. C. LITTLE, St. Louis, Mo.—This invention consists in preventing the radiation of heat from steam pipes and boilers by covering them with a coating of plaster of Paris cement, properly secured with a wrapper when necessary, this substance being cheap and durable, and offering great advantages as a superior non-conductor of heat.

COMBINATION INKSTAND.—GEORGE SCHMIDT, New York City.—This invention is a combination of an inkstand, wafer or sand box, calendar, and letter and envelope holders, and pen racks, whereby a very desirable article is obtained for the counting room, and one which may be constructed at a moderate cost and have a neat and ornamental appearance.

SHIRT COLLAR.—S. S. STONE, Troy, N. Y.—This invention is to make turn-over collars, either of paper or cloth, so as to fold down neatly over the band without being rumpled, on being adjusted to the neck, when the necktie is inserted. It also provides against the enameled surface of the collar coming in contact with the necktie or skin of the wearer; a serious objection heretofore existing against such collars. Another desirable feature is that the button hole is made to adjust itself to large or small buttons.

MACHINE FOR SMOOTHING OFF IVORY KEYBOARDS.—MILTON

**FRATT, Meriden, Conn.**—By this machine the keyboards for melodeons, pianofortes, and other musical instruments, are smoothed very nicely and effectively, whereby a great saving of time and labor is effected, beside securing superior workmanship.

**HAY FORK AND CUTTER.**—J. B. DRAKE, Picture Rocks, Pa.—The tines are formed with cutting edges so that when closed they form a spear point to adapt the instrument to be readily probed into the hay in taking its load.

**OIL WELL GAS PIPE ATTACHMENT.**—L. W. TURELL, SAMUEL STANTON, AND L. C. WARD, Newburgh, N. Y.—This invention consists in inserting in the gas pipe, at a point between the well and the furnace of the steam boiler, one or more partitions of wire gauze or wire cloth, so as to prevent, in case of the ignition of the gas, the flame communicating with the gas in the well, it being well known that a flame cannot pass through wire gauze or fine wire cloth.

**WATER WHEEL.**—G. E. CORBIN AND J. W. PUGH, Grand Rapids, Mich.—This invention consists in a peculiar shape and position of the buckets of the wheel, together with a ring and cleats or guides for directing the water properly to the buckets, and in a novel application of the case to the wheel, whereby several advantages are obtained over the ordinary wheels of the same class in use.

**WATER WHEEL.**—JESSE TUCKER, Adrian, Mich.—This invention relates to a new and improved water wheel of that class which are placed on a vertical shaft and are commonly termed horizontal wheels. The invention consists in a novel arrangement of issues, whereby it is believed that a greater percentage of the direct and reacting power of the water is obtained than with the ordinary horizontal wheels.

**FRICITION WINDOW SPRING AND FASTENER.**—H. NAYLOR, Pekin, Ill.—This invention consists in the employment of a catch and spring so constructed that when the window sash is closed, the catch will lock and fasten either the lower or upper sash, or when it be desired to raise or lower the sashes, will bear against the stile of the window with sufficient force to prevent the sash descending.

**PRIVY SEATS.**—J. M. DAVIS, Cincinnati, Ohio.—This invention consists of a cheap, simple and effective construction of a privy seat, the object being to prevent it being soiled.

**PADDLE-WHEEL.**—CHARLES A. TODD, New York City.—The object of this invention is to obviate the lifting of the water by the floats of the paddle-wheel as they emerge from it, thus relieving them of their back pressure to a great extent.

**COMPOUND FOR SETTLING COFFEE.**—GEORGE W. CARLTON, Brunswick, Me.—This invention consists of a compound for clarifying coffee, by which it can be accomplished in a most satisfactory manner.

**SCREW AUGER HEADS.**—RUSSELL JENNINGS, Deep River, Conn.—This invention relates to sawing the heads of augers, and it consists in a novel arrangement of a die and mold, and the manner of operating the die, whereby the desired work may be performed in a very rapid manner and with great perfection.

**CAR COUPLING.**—W. VAN VALKENBURGH, Smithfield, N. Y.—This invention consists in applying springs to the draw head so that they will resist the movement of the draw head when forced backward under concussions, and when pulled forward, thereby avoiding the sudden jars now occasioned by the stopping and starting of cars. It also consists in a novel latch arrangement for securing the shackle in the draw head, and also in the application of side springs to the draw head to admit of an easy lateral movement of the latter under the side surging of the cars.

**PAINT BRUSH.**—EMIL HISS, Delaware, Ohio.—The material of which the brush is composed, whether of hair, bristles, or other material, is clamped to the end of the handle by a draw-band, which enables the brush to be tightened on the handle as occasion may require, and which also permits the brush-part to be readily renewed.

**COMPOSITION FOR ROOFING.**—R. B. SMITH, Mount Pleasant, Ohio.—This invention consists of a mixture of tar and a peculiar mineral which is composed of hydro-silicate of iron and alumina, and carbonate of lime and magnesia.

**WASHING MACHINE.**—WM. AND A. G. KELSEY, Delavan, Wis.—This improvement consists in combining a washing apparatus with a tub in such manner that it may be used alternately for both washing and rinsing clothes; the devices for washing are simple, convenient, and effective, and after using them they are readily turned up on one side of the tub so as to leave it clear for rinsing the clothes, thus making one article serve both purposes.

**QUARTZ CRUSHER.**—A. LINDSAY, Malone, Franklin county, N. Y.—This invention relates to that kind of quartz crushers, by which the quartz is powdered under so-called chasers, revolving in a groove sunk into a solid bed plate. The improvement chiefly consists in an arrangement by which the powdered quartz is swept from the bed plate, and in a device by which all those parts which are not crushed fine enough, are returned to the crushing apparatus. The machine appears to be very efficient, and can be managed by one person.

**MEDICAL COMPOUND.**—P. M. DEVOS, New York City.—This invention relates to a medical compound, especially designed for the prevention and cure of cholera and other epidemic diseases, and is to be worn by means of a belt about the body of a person. From the characteristics of the several ingredients composing the compound, its use, at all times, would seem to be conducive to the general health of the person, but more particularly during the prevalence of any of the many epidemic diseases.

**LAMP EXTINGUISHER AND REGULATOR.**—C. E. LYON, Worcester, Mass.—By this improvement the flame can be regulated at pleasure, or extinguished at any moment, and without danger of an explosion, or allowing a bad odor to escape into the room.

**AUTOMATIC BOILER FEEDER.**—B. CHALFAUT, Williamsport, Pa.—By this invention the level of the water in the boiler can be preserved with the greatest accuracy, and no further attention is required after the improved feeder has been adjusted.

**HOOP SKIRT.**—JULIUS SCHLEISINGER, New York City.—The hoops of this skirt, instead of being united at the ends, are turned up and fastened to the edges of the open ends of the upper

part of the skirt, so that it is open all the way down, and the hoops do not interfere with the motions of the feet; the ordinary shape is imparted to it by a secondary skirt extending from the waist-band down a suitable distance.

**UNIVERSAL TOOL BOX.**—JAMES WOLFENDEN, Jersey City, N. J.—This invention relates to a universal tool box, and is intended for sliding off shafting, for cutting V and square threads, and also for steady rest. It is provided with two or more radiating tool holders, which are adjustable according to the size of the article to be turned, and which connect with a scroll in such a manner that the several tools close up simultaneously, and a uniform action of the tools on the work is effected.

**BILGE WATER GAGE.**—WILLIAM P. KIRKLAND, San Francisco, Cal.—This invention relates to a bilge water gage, composed of a perforated box, containing a float, which acts on an index rod extending through a tube to the deck, so that the depth of water can be ascertained at a glance.

**SHOE STRING FASTENER.**—E. S. SCRIPTURE, Brooklyn, N. Y.—This invention relates to a little spring catch, which when attached to a shoe or gaiter boot, serves to securely hold the surplus ends of the lacing strings after they have been drawn up snugly.

**PISTON PACKING.**—A. S. CAMEBON, New York City.—This piston packing consists of a wire placed spirally around the circumference of the piston, and is retained in the working face thereof by a spiral groove, so that the wire will be pressed tight against the inner surface of the cylinder by its own elasticity, and a packing is obtained, which is cheap, and not liable to allow the steam to pass it, as it wears.

**STEAM VALVE.**—A. H. WOODRUFF, Lansing, Iowa.—By this invention large openings for the supply and discharge of the steam are obtained, with a valve of comparatively small area; the pressure of the steam on the back of the valve is partially or wholly balanced; a full supply of steam is obtained at the beginning of a stroke, and the steam may, by adjusting a slide, be worked expansively to any desired degree.

**HOOP SKIRT.**—CESAR NEUMANN, New York City.—This invention consists of a hoop skirt, the wires of which are fastened in the pockets of the tapes by thread of silk, cotton, linen, or other material, in such a manner that the rivets or other metal parts generally used for this purpose can be dispensed with, and all danger of tearing the skirts worn over them is avoided.

**RE-DYEING CUSHIONS OF RAILROAD CAR SEATS.**—THOMAS BROWN, Albany, Albany County, N. Y.—This invention relates to a method of re-dyeing cushions of car seats, by which the color is firmly united with the fiber, and by which also the dye will be held to one side of the cushion, in case both sides want to be differently colored.

**APPARATUS FOR COOLING MILK, ETC.**—J. OWEN MOORE, Washingtonville, N. Y.—This invention has for its object the cooling of milk to a temperature allowing it to be transported; and the invention consists in so constructing the apparatus that the milk will be cooled while passing through a narrow channel, which is surrounded by water or any other cooling liquid, and in so constructing the apparatus that it can be easily taken apart for cleaning purposes.



**J. B. B., of N. Y.**—A mixture of two parts brick dust to one of plaster of Paris will make a mold for type metal. It is mixed with water to the consistency of egg yolks. A mold can also be made of plaster alone. The only breech-loading rifle with which we are acquainted, designed for open powder and ball, is the Colt's repeating rifle.

**A. F. P., N. Y.,** desires to know if the fact, that a large wheel passes over a greater distance in a given time than a smaller one, could not be applied to the rounding of curves by rail cars. We answer, yes, if all the curves were of the same radius and trended the same way, but if the wheels were rigidly secured to their axles, as usual, how would they run on a straight track? The principle of adapting the diameter of the wheel to a curve is applied to the carriages for heavy guns in fortifications.

**A. C. K., of N. Y.**—Geo. C. Round, Wesleyan University, Middletown, Conn., can probably give you the information you desire as to the method of reading the Signal Corps' cipher.

**J. S., of N. Y.**—The "Miller, Millwright and Engineer's Guide," published by Henry Carey Baird, 406 Walnut street, Philadelphia, gives instructions about hanging the sash saw, and Holly's "Art of Saw Filing," or Parsons's "Sawyer's Companion" explains the methods of filing and setting the saw.

**D. C. M., of Pa.**—We do not think fire armor is now used. The description in this paper, to which you refer, was intended mainly to furnish good air to firemen, when in burning buildings. Your plan of making coffee is not new.

**J. G. B., of Ky.**—We cannot tell you the exact process of welding cast iron and steel. We think, however, it is done by means of a flux and compression or percussion.

**G. W. H., of Pa.**—Woolen goods are bleached by the same process as straw goods, viz: fumigation by the fumes of burning sulphur, or soaking in a solution of sulphurous acid. The goods must first be thoroughly cleaned from grease, etc. A soap which will promptly remove the stains of crude petroleum oil from woolen and other goods is now a great desideratum. Some remedy for the evils attending the use of petroleum lubricating oil, in cloth factories, is in demand; here is a chance for the inventor. Watson's treatise on weaving, published by Baird, Philadelphia, is the book you want.

**B. C., of L. I.**—Newspaper controversies as to priority of invention are interesting to but few, and the public generally sympathize with the one who puts his ideas into some tangible form. In this case Dr. Andrews antedates your claim, as we heard him state that he discovered and applied the principle 16 years ago.

**A. L. H., of Ohio.**—You will fail in attempting to drive a mill and propel said mill through the water by wind power.

**J. T., of Del.**—To set a slide valve, put the valve in the chest, connect the gear and turn the crank to see if the eccentric rod is of the right length. If it opens one part more than the other, shorten or lengthen the rod one-half the amount required to make both parts open alike. When the valve runs square put it at the lead you require, turn the engine on its center and move the eccentric on the shaft, until the rods will connect. It will be then nearly in the right place, but will require some adjustment. You should give twice the lead you require if the valve is set cold, for the springing of the rods, lost motion and expansion will shorten the lead materially.

## NEW PUBLICATIONS.

"HAYES'S RAILROAD FAST EXPRESS WAGES COMPUTING TABLES," is the imposing title of a very useful compendium of calculations, the value of which is not enhanced by the title. The volume is an elaborate and comprehensive arrangement intended for railroad men, and admirably adapted to the requirements of the managers of large concerns who have to calculate the pay per hour, day, week, and month for men employed at varying rates of wages. The tables contained in the volume are calculated by tenths, and range from the rate of sixty cents per day to five dollars. With the plan adopted by the compiler, no fraction between these two points can escape observation, and all the calculations which so often occupy valuable time and snarl overtaxed brains, are avoided.

From a careful examination of the volume, and several experimental analyses of the compiler's plan, we judge that the publication is of great value to all who are compelled to make calculations from data so varying as the difference in amounts and time, and the wages of employes in large concerns.

It is handsomely got up, the paper printed on only one side, and the calculations mathematically correct. Published by Rockwell, Baker & Hill, Buffalo, or by Lester Hayes, the compiler, Kent, Portage county, Ohio.

## THE MARKETS.

**GOLD** has ruled quiet and steady. There is but a moderate demand for export, and only a fair amount is being taken for Custom dues. The bulk of the transactions have been at about 150 3/4 cent. Call loans on stock securities are readily obtained at from 4 1/2 per cent; on bond and mortgage 6 1/2. First-class bills, sixty days, endorsed, 6 1/2 cent, and for three or four months, 7 1/2 cent additional. Government securities are held firmer, and prices rule a shade higher. Stocks in fair demand and without decided change. There is a quiet market in most standard articles. Holders are firm and buyers not over anxious. Building materials have slightly advanced. Coffee has experienced a rise, particularly in West India varieties. The grain and flour market is steady without much foreign demand. Corn is somewhat lower. Iron, pig, is dull, and the demand for bar and scrap light. Lead in fair demand and prices somewhat lower. The market for leather is looking up. The largest advance is noticeable in builders' materials, for which there is a good demand. Nails, especially some varieties of cut, have advanced 1/4 cent 3/4 lb.

**ASHES**—Pots are quite dull, but with continued light receipts, market steady; the sales are 500 bbls. at \$8 5/4. Pearls are nominal; we hear of no business.

**BRICKS**—Common Hard have advanced to \$12. Croton and Philadelphia are unchanged at \$14 1/4 for the former, and \$10 for the latter.

**COFFEE**—Laguayra, 12 1/4@13 1/4 gold, in bond. No shipments from Rio for the States.

**COPPER**—Detroit, 31@31 1/4; Portage Lake, 31.

**COTTON**—Market steady. Ordinary, 27@28; middling, 28@27.

**FLOUR**—Common brands, \$3 10@39 30; Genesee extra, \$10 10@13 00; Canada, \$8 30@12 00.

**MEAL**—Dull; Rye-flour and corn lower.

**GRAIN**—Corn, 84; medium Western, 87 1/4; Oats, 60@65.

**IRON**—Market inactive. No. 1 American pig \$47@48. Scotch, \$47@50. Bar and scrap very quiet.

**LATHS**—Are firm, with sales of Eastern, at \$3 25@3 35, three months.

**LEAD**—Pig has been offered at lower prices, and buyers have purchased more freely; the sales are 400 tons best (Graville), to arrive, at 7 1/4 cents; 25 do. common Spanish, 7, gold; 2,000 tons Spanish and German, on terms not made public; best English is sold at 7 1/4. The bulk of the stock of Foreign, however, is not offered, holders awaiting the turn of events in Europe. Bar, Pipe, and Sheet are steady and active at 11 1/4 cents, cash.

**LEATHER**—The market for Hemlock Sole continues active, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33@34 cents; Middle do., 33@36; Heavy do., 36@37; California Light, 31@32; Middle do., 33 1/4@34 1/4; 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**—Rockland is in good demand, with sales of 5,000 bbls. Common at \$1 50; Lump is nominal at \$2 10, cash.

**LUMBER**—There is an active demand for Eastern Spruce, with sales of 1,433,000 feet at \$23 50@23 75, usual terms; 143,000 feet Georgia Pitch Pine Lumber, at \$38 for Flooring Boards and Step Plank, as they run; \$40 for Scantling, and \$45 for 5 by 12 Timber, 3 mos.

**NAILS**—Cut are very firm and scarce, with a tendency to advance; some sizes are scarce, and for these 1/4 cent more is paid. We quote: Cut, 6 1/4@7 cents; Clinch, 8 1/4; Forged Horse, 33@34; Pressed do., 22@24; Copper, 50; Yellow Metal, 33; Zinc, 30; and Wrought Ship and Boat Spikes, 7@8 cents, as to sizes, net cash.

**SUGAR**—Prices have favored sellers, and we have to notice an advance of 1/4 of a cent 3/4 lb on Refining grades, bringing Fair Refining Cuba to 10 1/4@10 1/2 cents; Good, do., to 11 1/4@11 1/2; and No. 12 Box to 11 1/4@11 1/2, 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 1/2 cents; White A, 16 1/4; and Yellow C, 15 1/2—the range of other manufacture is 16 1/4@17 cents for Hard; 15 1/4@16 1/4 for Soft White (B and A only), and 14 1/4@15 1/4 for Yellow.

**WIRE**—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 5c. for No. 18 covered, and 3c. for uncovered.

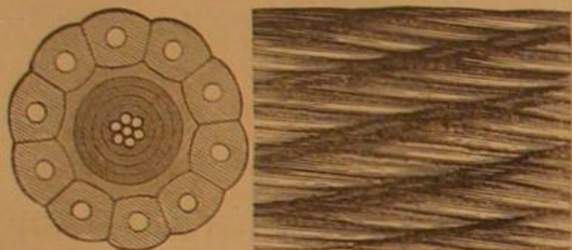
**WOOL**—Market unsettled, and prices 10@20 3/4 cent lower.

**ZINC**—9 1/4c. less 4 per cent. for gold. Market dull.

## THE ATLANTIC TELEGRAPH.

The successful laying of the submarine telegraph between Ireland and Newfoundland marks an era in ocean telegraphing. Much credit is due the gentlemen who have persisted, under the depressing influences of successive defeats, in determining the practicability of uniting the two continents by a telegraphic cable. There can be no reasonable doubt that the feat of transmitting legible signals, conveying messages between Heart's Content, Newfoundland, and Valentia Bay, Ireland, has been performed, however much the declared success of the cable of 1858 was questioned. We sincerely hope that this success may be permanent.

The cable having been laid, the only fears for the permanence of its continuity must arise from the disturbing elements on the bed of the ocean, which, with the best scientific and mechanical appliances, are comparatively undetermined. The data in regard to ocean currents over the line of the telegraph, and in regard to the form and condition of the bed on which the cable is supposed to rest, are not sufficient to base a logical argument upon as to the permanence and reliability of the cable's continuity. These data also are contradictory; the most favorable representing an elevated plateau, undisturbed by the undulations of the surface, and beyond the reach of currents and the abrasions of icebergs. Sudden depressions and perpendicular precipices were not believed to exist, which might expose a portion of the cable to continual chafing until the connection was



severed. But other examinations occasion a doubt whether these conditions exist in so favorable a form. The cable crosses a portion of the Grand Banks, on which it is believed very large icebergs sometimes ground. Soundings, however carefully conducted, could hardly be depended upon to discover the existence of high rocks, or other elevations, descending precipitously to great depths. It is hardly possible to ascertain the point where the elevated plateau would sheer off to a deep chasm or valley. The lead-line might strike the brow of a bluff and glide off into water of great depth when all appearances would indicate a uniform plane. It is evident that, even if there were no deep sea currents in the path of the cable, whose influence reached to the bottom, there might be places where the cable would hang suspended from a point, which is as yet undiscovered, but which would project near enough to the surface to be affected by a current.

The fact, therefore, that telegraphic connection has been completed between the two continents, affords us but little encouragement for the perpetuity of such connection. The bed of the ocean is an unknown region which no means, as yet discovered, can enable us to thoroughly survey.

To give our readers an adequate idea of the present telegraph we reproduce from the *Engineer* the external view of the cable, with an end section, both full size. The cable of 1858 is well known to our readers by the numerous specimens to be found all over the country. The difference between the two is in a heavier conductor, consisting in each case of seven copper wires—six laid round one; in the insulation, which, in the present cable, is composed not wholly of gutta-percha, as was the former, but of that substance alternated with Chatterton's compound, an English patent, and in covering the sheathing of iron wires simply with Manilla yarn instead of india-rubber and tar. These variations do not constitute any very radical difference between the cable of 1858 and that of 1866.

One of the most remarkable circumstances attending the laying of the present cable is the directness of the route taken by the *Great Eastern* and the small percentage of slack of the cable paid out compared with the distance run. The whole distance run was 1,669 miles and the whole length of cable laid 1,864.

Much of this difference was made at the shore ends. The log of the steamer shows:—

SATURDAY, 14TH.—Distance run, 108 miles; cable paid out, 116 miles.

SUNDAY, 15TH.—Distance run, 128 miles; cable paid out, 139 miles.

MONDAY, 16TH.—Distance run, 115 miles; cable paid out, 137 miles.

TUESDAY, 17TH.—Distance run, 118 miles; cable paid out, 139 miles.

WEDNESDAY, 18TH.—Distance run, 105 miles; cable paid out, 125 miles.

THURSDAY, 19TH.—Distance run, 122 miles; cable paid out, 129 miles.

FRIDAY, 20TH.—Distance run, 117 miles; cable paid out, 127 miles.

SATURDAY, 21ST.—Distance run, 122 miles; cable paid out, 136 miles.

SUNDAY, 22D.—Distance run, 123 miles; cable paid out, 133 miles.

MONDAY, 23D.—Distance run, 121 miles; cable paid out, 138 miles.

TUESDAY, 24TH.—Distance run, 121 miles; cable paid out, 135 miles.

WEDNESDAY, 25TH.—Distance run, 112 miles; cable paid out, 130 miles.

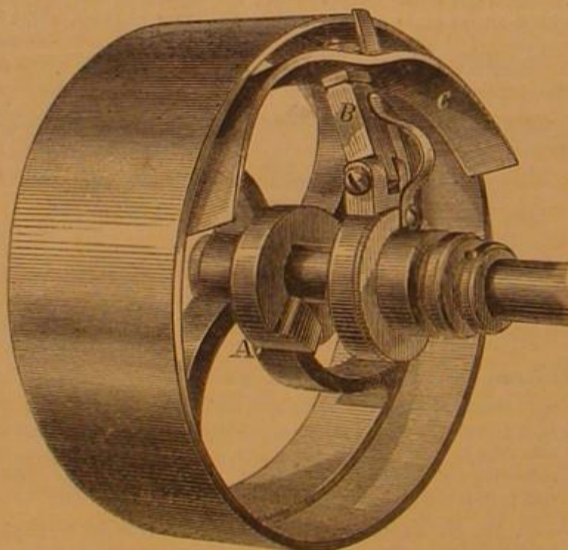
THURSDAY, 26TH.—Distance run, 128 miles; cable paid out, 134 miles.

FRIDAY, 27TH.—Distance run, 112 miles; cable paid out, 118 miles; which, with shore end off Valentia, distance 27 miles, cable paid out 29 miles, makes distance run 1,669 miles, and paid out, 1,864 miles.

The raising of the last cable, and its connection with this continent, which it is hoped and expected can be successfully accomplished, with the relaying of the connection between Newfoundland and the main land, will give two entire lines between America and Europe. In that case we believe it would be good policy for the directors to reduce the charge for conveying messages from the present exorbitant rates.

## BIRDSALL'S PULLEY.

The advantages of friction pulleys for driving machinery are so well known and have been alluded



to so frequently in these columns, that we shall not repeat them. It is not amiss, however, to state once more that one pulley and one belt are dispensed with by such an arrangement, as also the expense of repairing the same.

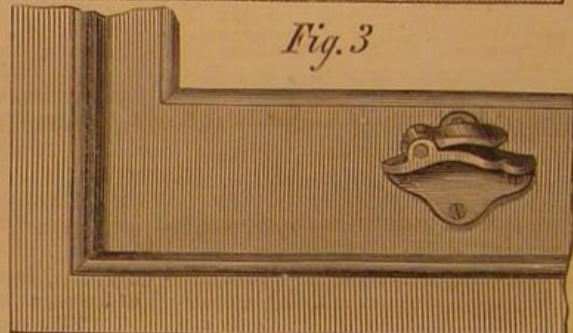
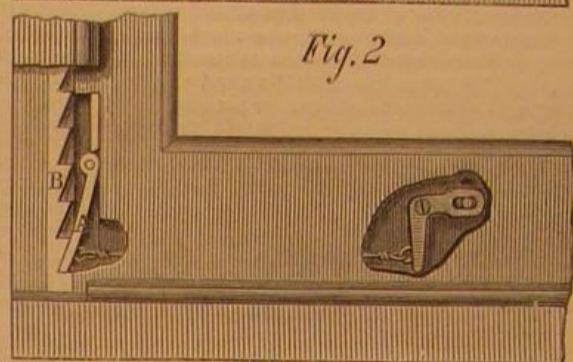
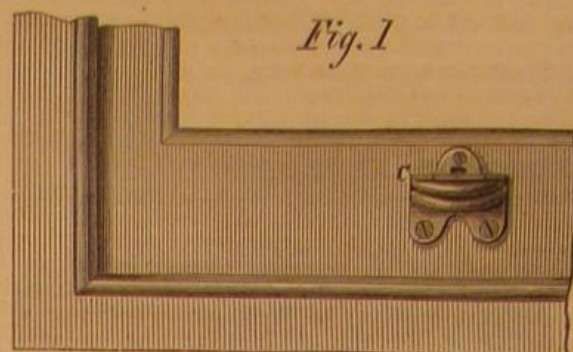
The pulley here shown is adapted for driving heavy machinery, and is a combination of the clutch and friction principles usually employed singly. It is, in detail, a pulley turned up true inside and out, having a socket, A, in the hub to receive a dog on the sliding collar. The end of the shipping bar works in a recess in the collar, as usual, and by throwing the same in gear, the dog falls into the socket, and the toggle joint, B, throws the spring plate, C, into contact with the rim of the pulley, the friction of course aiding in driving the main shaft. This is the whole arrangement, and it is claimed to be particularly adapted to heavy machines for the certainty of its action.

A patent on this pulley is now pending through the Scientific American Patent Agency, by E. M. Birdsall, Penn Yan, N. Y., whom address for further information.

THE Oakland Works, at Sag Harbor, N. Y., are finishing a fine clock for the Court House at Salt Lake City.

## TOSHACH'S SASH SUPPORT.

The petty trials of life are often harder to bear than positive afflictions, and of all nuisances we place an obstinate window sash at the top of the list. It is not necessary, perhaps, to harrow up any one's feelings by a recital of all the casualties and annoy-



ances springing from this cause; we therefore proceed to give an infallible remedy for the ills a window sash is heir to. That remedy is illustrated herewith.

Figures 1, 2, and 3 show, respectively, one corner of a window sash and framing, with the apparatus for opening it—a section of the framing revealing the arrangement, and a different arrangement of the parts externally to accomplish the same end.

It will be seen that the sash is without cords or weights, and that it is held at any desired point by a spring dog, A, working in a rack, B. The dog is connected by a wire and a lever to the thumb piece or handle, C, by which the window is raised, so that in raising the window and removing the hand the sash stops itself at the point it was raised to; it is lowered by simple pressure on the projection, D.

This mechanism is certain in action and not costly. The parts are few and simple, and will last for years with proper care. All sudden dropping, so fatal to windows with large and costly panes, is obviated, and the operation is so simple as to be easily understood by children and servants.

It was patented on June 27, 1865, and Jan. 9, 1866. For further information address Wm. Toshach, Sec'y National Manufacturing Co., No. 52 William street, New York.

## Patent Swindling.

A correspondent in Altoona, Pa., complains that he, among others, has been swindled by a man representing himself as an agent for a patent corn sheller. The game appears to be selling the right to use the machine and a case of castings for making them, receiving the money, giving a receipt, but never sending the castings.

We cannot tell whether the patent alluded to has ever been issued. If so, it was probably by some other name than that by which it was sold. The game is an old one and has before been exposed in our columns. The only safety is to refuse to pay for what one does not receive, and never trusting to the mere word of an irresponsible agent. In such cases the written promise and receipt of an unknown and uncertified man is no protection nor assurance against a swindle.

# THE Scientific American

MUNN &amp; 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 and advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attended to.

"The American News Company," Agents, 121 Nassau street, New York.

VOL. XV., No. 7, [NEW SERIES.] Twenty-first Year.

NEW YORK, SATURDAY, AUGUST 11, 1866.

## Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Turbine wheel.....	95	*The Atlantic Telegraph.....	102
Notes on Boilers.....	96	*Birdsall's Pulley.....	102
Our Special Correspondence.....	97	*Toshach's Sash Support.....	102
Casting a Twenty-inch Cannon.....	97	*Patent Swindling.....	102
Foreign Scientific News.....	98	*Success the Popular Estimate of Value.....	103
Photography and the Kaleidoscope.....	98	*An Absurd Tool.....	103
Photographing a Volcano.....	98	*Important Decision—Extension of Tanner's Car-brake Patent.....	103
The Prussian Army.....	98	*The Charges of the Atlantic Telegraph Company.....	103
Power of Lightning.....	98	*Atlantic Telegraph—Exorbitant Charges.....	103
Thunder Storms—Protection against Lightning.....	99	*Patent Claims, 104, 105, 106, 107, 108	103
Breech-Loaders vs. Muzzle-Loading Fire-arms.....	99	*Advertisements.....	108, 109
Board Measure.....	100	*Improved Stove Attachment.....	110
The Mississippi Levees.....	100	*Improved Collar Fastening.....	110
An Unbeliever in Breech-loading Fire-arms.....	100	*The Great Organ at Plymouth Church.....	110
Millers Please Notice.....	100	*Primitive Beehive.....	110
New Inventions.....	100	*Prospectus.....	110
Notes and Queries.....	101		
New Publications.....	101		
The Markets.....	101		

## SUCCESS THE POPULAR ESTIMATE OF VALUE.

Nothing is easier of demonstration than that the value of an improvement will not be recognized by the world at large, and particularly by governments, until its necessity has been proved by the failure of old-fashioned substitutes. In our late war the Government used breech-loaders, but it was only because it could not obtain muzzle-loaders in sufficient numbers. After contracting with the British for the Enfield rifle, and purchasing large quantities of the worthless Austrian muskets, it permitted, rather than encouraged, the use of our own superior breech-loading rifles. To be sure some regiments and companies were supplied, early in the war, with the Sharps rifle, but it was because the old-fashioned muzzle-loader could not be obtained, either in this country or in Europe, in sufficient numbers to arm the hundreds of thousands of soldiers which the necessities of the nation called into service. Yet at the first Bull Run battle Burnside's Division was relieved by the Second Connecticut Regiment, eight companies of which were armed with the Sharps rifle, with which the most ordinary soldier could deliver from ten to fourteen shots per minute, and the practiced man extend the number to twenty.

From the remarks of the press in regard to the Prussian needle gun, which it is claimed won the Prussian victories, the uninformed reader is led to infer that this weapon is the most effective known for infantry and cavalry. This is not so. The needle gun is a breech-loader, and in this fact alone is its wonderful superiority over the Austrian or other muzzle-loading muskets. We have had for many years much superior weapons—many of them—and they were thoroughly tested in our war, but never were the conditions so favorable for making a contrast as in the present European contest. There the whole Prussian army, of drilled men, horse and foot, were provided with a breech-loader, the use of which had been taught to them. On the other hand, the Austrians adhered to the old-fashioned muzzle-loading piece. There were two armies equipped with weapons entirely differing in operation, and the contrast, if any existed, must perforce be very marked. In our case the combatants on each side were armed very much the same, with few and isolated exceptions. Where one regiment was provided with breech-loaders, there were many others using only the common muzzle-loader. The superiority of the one over the other was shown mainly in those encounters in which a single regiment, armed with breech-loaders, was opposed to an equal or superior force, using the muzzle-loader. These exceptional cases were not important enough

in their general results to attract marked attention. The assumed peculiarity of the Prussian arm is in the ignition of the charge at the base of the ball instead of at the breech. This, it is claimed, increases the velocity, and consequently, range and penetration, of the missile. But this is not a new device, nor is it peculiar to the needle gun. Breech-loaders have been constructed in this country which fired the charge at the front of the cartridge. It does not appear that in the battles fought in Europe the circumstances were favorable to the test of range, and all that can be claimed for the Prussian gun, over muzzle-loaders, is greater rapidity in delivering shots.

This was amply substantiated and demonstrated in our own contest, but because the circumstances of the trial were on a smaller scale than those in Germany, the world at large gave them very little attention. The lesson which the nations of Europe are beginning to learn from the Prussians was given in our own struggle, but unregarded because unaccompanied with the imposing circumstances which attended the late European battles.

## AN ABSURD TOOL.

The latest English novelty in the way of machine tools, is a hydraulic press slotting machine. That is to say, there is a belt, pumps, and valves to drive a hydraulic cylinder, which, in turn, operates the tool, the cylinder being placed directly over the beam which carries the cutter.

In our experience with machines of this class we never remarked a lack of force or a want of simple mechanical agents to obtain it, but we have found much difficulty in getting tools to stand heavy cuts. Precisely how a complicated water cylinder, with valves, three-throw pumps, and their pistons, is to remedy this, we cannot see. There is no other trouble with a slotting machine which is not easily remedied. Not the slightest chattering is perceptible in well-made machines, and work is done every day up town, in the Novelty Works, Morgan Works, and others, which can be polished without the use of a file. It is merely a question of fine feed and a sharp, properly-made tool. With these adjuncts, and soapy water, neat and beautiful work can be executed.

To complete the efficacy of this belted three-throw pump and water-cylinder slotting machine, we are informed that it has no self-acting feed "as large slotting machines are best worked without such a device—the constant attendance of the workman being necessary." This assertion will surprise many. Those who have seen a key-way cut (fed by hand) in a heavy connecting rod, and the same work done by a regular feed, will know how much importance to attach to it. It is not possible for man to feed by hand, in any thing like the same time, as regularly as an automatic arrangement for the purpose. Nor is it by such machines that we shall advance in the art of iron working. The object is to simplify, not to add to the complexity of our tools, and no advantages exist in a three-throw pump water-cylinder slotting machine that are not obtained at far less cost of construction, to say nothing of repair, in a rack and pinion, or a crank machine.

## IMPORTANT DECISION—EXTENSION OF TANNER'S CAR-BRAKE PATENT.

We have before us the decision of the Commissioner of Patents in the above case, which settles, so far as the Patent Office has jurisdiction, a question that affects the rights of inventors and assignees in patents sought to be extended.

It appears that A. G. Batchelder and L. F. Thompson applied for a patent for an improved car brake, on the 26th of June, 1847, and after an unusual delay, the patent was issued June 6, 1852, to Henry Tanner, assignee of said inventor.

In due time application was made for the extension of said patent, by Batchelder, and the administrator of Thompson. Opposition was made to this extension by interested parties, on the ground that it was not issued to the inventors, but to an assignee, consequently the Commissioner had not power under the 18th Section of the act of 1836, to extend the patent. The Commissioner, however, cites the fact that on two previous occasions decisions

had been rendered, that a patent thus issued might be extended for the benefit of the inventor, and that this had been misunderstood in the Office to be the correct rule to govern its action in such cases. It is settled by judicial decisions that the term "patentee," as employed in the statute, is equivalent to the term "inventor," so far at least as to exclude any person who is merely an assignee.

The Commissioner took the broad and correct ground that the inventor only could apply for the extension; and, furthermore, that the extension would inure solely to the benefit of the inventor.

In the case of Wilson vs. Rosseau, Judge Nelson, for the Court, decided that the extension of a patent does not inure to the benefit of assignees or grantees under the original patent, so as to vest in them any exclusive right. But the benefits of such renewal, extended to assignees or grantees, is limited to those who were purchasers of the patented article previous to the time of the renewal, and saves to such persons the right to use the machines so purchased by them at the time of such renewal, to the extent of their interests, be that interest in one or more machines.

We understand that this decision of Justice Nelson does not, however, apply to the parties who are now using car brakes that embrace the principles covered by Tanner's patent, as they were simply licensed to use the invention for a certain term, which did not include the extended term.

## THE CHARGES OF THE ATLANTIC TELEGRAPH COMPANY.

The published scale of prices of the Atlantic Telegraph Company shows that for a message of twenty words, including date and address of sender, the sum of £20 will be charged—which is equal to \$150 American money at the present rate of gold; further, that all figures must be written out, when they will be charged as words. Messages in cipher will be double the above rates.

Vast amounts of money have been invested and sunk in laying the cable, and its permanency is at least uncertain, but it does not seem to us judicious to attempt to get all the money back this summer. There are not many journals or firms that can afford to have regular messages of any length, and, under the circumstances, the news transmitted would be scanty and indefinite. Heavy rates defeat the end and aim of such enterprises, which are to be a popular medium for the transaction of business. Short names will be popular, and the English language will be sorely tortured to express a great deal in a few words. The definition of "cipher messages" will have to be laid down unmistakably, and we imagine it will be difficult to draw the line.

The cable, however, is not indispensable; steamers cross in nine days; from land to land in much less time; and, except in cases of great urgency, the capacity of the line will not be taxed to its utmost, unless the tariff of charges be considerably reduced.

Doubtless the competition of the Collins Overland Telegraph will have a healthy effect, and aid materially in lowering the price.

## Atlantic Telegraph—Exorbitant Charges.

We had occasion to send a telegraphic message to our correspondent in London, through the Atlantic Cable, consisting of exactly twenty words, which, according to the published schedule, should have gone forward for £20 sterling, but the director at this end charged £24, or \$120 in gold, so as to cover the date of transmission.

We wish the Submarine Telegraph Company success, but it seems to us impossible that the public can submit to such exorbitant, and as it appears to us, unreasonable charges.

If this company insist upon putting in a date which was of no importance to us, we submit that we ought not to be compelled to pay \$5 in gold for every word thus interpolated by the Company.

GENERAL GRANT has been promoted to the position of "General of the Armies of the United States," a grade recently created by act of Congress. There has been some bother among military men as to what device should be adopted to designate his high rank. We suggest a gold plate, with A (1) engraved upon it.



ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JULY 31, 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.

56,687.—APPARATUS FOR WORKING HIDES.—A. Adler, Paris, France.

I claim the machine for working and preparing skins, constructed and arranged for operation substantially as herein set forth and described.

56,688.—WASHING MACHINE.—Ambrose Alexander, Middleville, Mich.

I claim as new the employment of dash board, I, with supporting friction rollers, J, in combination with a compound leverage, A D E F and G, for operating the same as substantially described.

56,689.—TRACE BUCKLE.—R. J. Algeo, Kalamazoo, Mich.

I claim the slotted sides of the frame, C, in combination with the bolt, B, and tug cap, D, constructed as described and operating in the manner and for the purpose specified.

56,690.—SMOKE AND DRYING HOUSE.—H. A. Ame- lung, New York City.

I claim, First, The application of one or more soot catches, I, in combination with the grate, h, and diaphragm, g, in the interior of the furnace, F, in the manner and for the purpose substantially as herein set forth.

Second, The movable beams, E, in combination with the hoisting tackle e f, or its equivalent, and with the drying or smoking house, A, constructed and operating substantially as and for the purpose herein shown and described.

56,691.—FEATHER-COVERED PARASOL.—Gustav Anton, Philadelphia, Pa.

I claim as a new article of manufacture, a parasol having a top or covering composed of feathers, secured to a central piece of wood or other suitable material, substantially in the manner set forth.

I also claim in combination with the improved covering the described tilting motion of the same upon the stem when the latter is made adjustable in length, substantially as and for the purpose described.

56,692.—MEAL AND FLOUR SIFTER.—Francis Arnold, Haddam Neck, Conn.

I claim the metallic plates, E E', connecting the paddles (C and D), in combination with the adjustable sieve, B, and handle, F, when arranged and used as and for the purposes set forth.

56,693.—GATE.—Vantuyt Babcock, Marshall, Mich.

I claim the arrangement and combination of the rail, G, saddle pieces, I, rollers, R R R', and supplemental posts, E and J, with an ordinary gate and fence, substantially in manner and for the use herein specified.

56,694.—STEAM GAGE.—Richard C. Blake, Cincinnati, Ohio.

I claim spiral corrugations in diaphragm spring of a steam gage, substantially in the manner and for the purposes set forth.

56,695.—PORTABLE FENCE.—John Breneman, Mount Joy, Pa.

I claim the combination and construction of the two panels of a fence so that the upper and lower rails, R1 R2, of the one will pass between those of the other, the ends of the rails of every alternate panel provided with a short piece, S B, forming an open space for a key board, k, passing through the over-lapping ends and firmly uniting them, in the manner and for the purpose shown and specified.

56,696.—HARVESTER RAKE.—J. O. Brown, A. Ing- ham, and F. T. Lomont, Massillon, Ohio.

We claim, First, The rake, R, pin, r, weight, t, and slide, k, in combination with the tipping platform, A, guide, o, and notches, u n', arranged as and for the purpose substantially as set forth.

Second, The roller, H, apron, H', and cords, c' I', or their equivalents, in combination with the pulleys, F J, and lever, J', substantially as and for the purpose described.

Third, The shaft, c, arms, E F, and slide, k, in combination with the arm, f, lever, J', and platform, arranged and operating substantially as and for the purpose specified.

Fourth, The platform, A, roller, H, and apron, H', in combination with the cords, c' I', lever, J', and arm, f, substantially as and for the purpose described.

Fifth, Hanging or pivoting the platform, A, to the rear end of the shoes by means of the arms, E and F, when said platform is provided with the rake, R, grooves, i, and slats, j, substantially as and for the purpose specified.

Sixth, Attaching the arm, P, to the swarth board, D', in combination with the cords, I, or equivalent lever, J', and platform, as and for the purpose set forth.

56,697.—RE-DYEING THE CUSHIONS OF CAR SEATS.—Thomas Brown, Albany, N. Y.

I claim, First, Exposing the cushions after the color has been applied to them, to the action of steam, substantially as and for the purpose set forth.

Second, The boiler with a perforated shelf, a, and close-fitting cover, b, in combination with a furnace, B, and with the cushions to be steamed, substantially as and for the purpose described.

Third, The frame, C, with adjustable sides, c d, constructed and operating substantially as and for the purpose set forth.

56,698.—HARVESTER.—Robert Bryson, Schenectady, N. Y.

I claim, First, Pivoting the forked ends of the harvester pitman rod, R, to an adjustable strap, p, of a two-part pitman box, s, substantially as and for the purpose described.

Second, Constructing the frame, D, substantially as described, in combination with supporting this frame upon the axle, B, of two drive wheels outside of a hinged frame, C, substantially as set forth.

Third, The application of guards, G, to the inside gear, A', of the driving wheels, substantially as described.

Fourth, The arrangement of the lever, J, so that it forms an intermediate connection between the hand lever, E, and the finger beam, and its inner long arm, slides upon the lower surface of the platform plate, g; the said lever, J, and the hand lever, E, being applied to a harvester having two hinged frames, C D, and a hinged cutting apparatus, all substantially as described.

Fifth, The arrangement of the double tree, k, staple, h', pin, h', hook, l, chain, m, and hook, j, in the manner and for the purpose herein described.

56,699.—PISTON PACKING.—A. S. Cameron, New York City.

I claim the spiral packing wire, b, in combination with the piston, A, substantially as and for the purpose described.

56,700.—BED-RECOIL SPRINGS FOR PRINTING PRESSES.—Andrew Campbell, Brooklyn, N. Y.

First, I claim so applying the bed-recoil springs of a printing press that they are always in contact or connection with the bed of the press through levers operating the springs, substantially as described.

Second, I also claim so applying the bed-recoil springs of a printing press that the bed when running faster in one direction than the other, may have the required degree of recoil given to it in either direction by one set of springs, substantially as described.

56,701.—PRINTING PRESS.—Andrew Campbell, Brooklyn, N. Y.

I claim the mode of converting the rotary to a reciprocating or rectilinear motion, as above described, or its mechanical equivalent, for the purposes set forth.

I also claim the V-shaped bearing, T, as applied to the front guide of printing presses, substantially as described and for the purposes set forth.

56,702.—DRY DOCK INDICATOR.—Peter F. Campbell, Jersey City, N. J.

I claim the combination with the section or compartment of a dry dock, of the floats, and an indicating apparatus, substantially as and for the purposes set forth.

56,703.—BRICK MACHINE.—E. P. H. Capron, Springfield, Ohio.

First, I claim the combination of the pressure roller, P, with flap, O.

Second, The combination of the hinged flap, O, with its sliding rods.

Third, With the follower, N, the combination of the rod, J, when the latter is provided with an articulated lever, K, at its upper end, to raise the lid, the whole being constructed and arranged as described.

56,704.—COMPOSITION FOR SETTLING COFFEE.—George W. Carleton, Brunswick, Me.

I claim a composition for clarifying coffee, made substantially as herein specified.

56,705.—BORING AND GRINDING APPARATUS.—Samuel Cary, Centerville, La.

I claim, First, The application and use of tempered steel notched or toothed plates, secured so as to be adjustable to the arms of a metal flanch to form a boring and grinding mill, for the purposes herein set forth.

Second, The drilling, boring, and grinding apparatus in combination with the screw-feed mechanism and driving machinery, as and for the purpose specified.

56,706.—BOILER FEEDER.—Brantly Chalfant, Williamsport, Pa.

I claim, First, The many-chambered barrel, A, placed in an oblique position between suitable bearings and provided with pipes, E F G H, substantially as and for the purposes set forth.

Second, Also, the self-cleaning key, E', in combination with the standard, D, cap, B, and barrel, A, constructed substantially as and for the purposes described.

56,707.—STOVEPIPE TOP.—William Chappell, Buffalo, N. Y.

I claim the T-pipes, C C, provided with holes, f f, or their equivalent, in combination with the spring, e, and adjustable pipe, A, provided with elbows, c c, the whole arranged and operating substantially in the manner set forth.

56,708.—GRAIN DRIER.—George Clark, Buffalo, N. Y.

First, I claim the construction and arrangement of grain-drying perforated cylinders and two or more hot-air chambers in such relation to each other that the hot-air chambers shall be heated centrally within the cylinder (the body of grain to be dried being outside of the chambers), and the hot air supplied centrally to each chamber by means of hot-air conducting pipes so as to issue from all parts of the chambers and pass directly through and at right angles (or nearly so) to the direction of the body of grain passing between the cylinders, substantially as described.

Second, Placing and using screws, or equivalents, in the grain space between the cylinders so that the grain must pass through these screws and thereby be turned over or changed in the position of its kernels in reference to the inner and outer cylinders, and thereby insure all parts of the grain to be acted upon equally by the hot air, substantially as described.

Third, Dividing the inner perforated cylinder into two, three, or more hot-air chambers, each chamber being separate and independent of the other, and each having distinct hot-air flues, so that the hot air in each chamber may be regulated and controlled independently of the other, for the purposes and substantially as set forth.

Fourth, Placing and arranging the said perforated cylinders and hot-air chambers within an outer stack, so that an evaporation space shall be formed between the larger cylinder and the outer stack, and evaporation from each chamber be discharged, substantially as set forth.

Fifth, The construction, application, and use of an inner furnace door or valve, Z, opening inwardly, for the purpose and substantially as described.

Sixth, A weighted, conical valve, P, placed at the top of the drying cylinder to insure an equal distribution of the grain into all parts of the grain-drying space, substantially as described.

Seventh, In a grain drier constructed substantially as herein described, I claim the arrangement thereof of the valves, T, and movable disk, T', for the purposes set forth.

56,709.—DRAUGHT COCK FOR SODA WATER APPARATUS.—Wm. P. Clark, Boston, Mass.

I claim a soda cock constructed with an induction pipe, H, and two sets of induction pipes, J and L, and two valves, F and G, actuated successively by a common stem, E, and resting upon different valve seats, said several parts being respectively constructed and the whole combined and arranged for operation, substantially as set forth.

56,710.—MEASURING FUNNEL.—John W. Clark, Kingston, Wis.

I claim a funnel provided with the screw, E, arranged to operate substantially as and for the purpose set forth.

56,711.—SULPHUR DUSTER.—John W. Clark, Kingston, Wis.

First, I claim the fan, B, mounted in a suitable case and arranged to operate in combination with the spout, F, hopper, E, and feed wheel, a, or their equivalents, substantially as shown and described.

Second, In combination with the nozzle, H, with its perforated cover and the valve, n, arranged and operating as set forth.

Third, The auxiliary tube, m, arranged to operate in connection with the spout, F, as set forth.

56,712.—PACKING PROJECTILES FOR RIFLED ORD- NANCE.—John Webster Cochran, New York City.

First, I claim the band, b, saturated fibrous material, f, and coiled wire, d', in combination with each other and with the circumferential and longitudinal grooves in the projectile, substantially as and for the purpose herein specified.

Second, The grooves, c c, arranged with reference to the grooves, a a and m, for the reception of depressions of the expanding band, as and for the purpose herein set forth.

56,713.—PADDLE WHEEL.—Elisha P. Colburn, Boston, Mass.

I therefore claim the improved arrangement of the guide wheel, e, and the bearing wheels, d d, the latter under such arrangement having the wheel, c, between them, as set forth.

56,714.—CLOTH GUIDE AND BINDER GAGE FOR SEW- ING MACHINES.—L. T. Conant, New Lisbon, Ohio. Antedated July 25, 1866.

First, I claim the base plate, A, with its gaging lips, c c, slot, D, binder slot, F, upright post, F, and screw, G, in combination with the arms, M M, binders, J, and spring, N, as and for the purposes specified.

Second, I claim the adjustable inclined arms, M M, in their combination with the base plate, A, upright post, F, regulating spring, N, and binders, J, as and for the purposes specified.

Third, I claim the seamless clamping binders, J, or an equivalent, with its regulating nut, I, and separating block, K, in combination with the base plate, A, and inclined arms, M M, as and for the purposes specified.

Fourth, I claim the regulating spring, N, or its equivalent, in combination with the inclined arm, M M, and binder, J, all operating as and for the purposes specified.

56,715.—PORTABLE SHAVING CASE.—Thomas P. Couard, West Grove, Pa.

I claim a case or box, constructed to receive the various imple- ments or appurtenances necessary or desirable in shaving, to- gether with a heating apparatus, substantially as described.

56,716.—CAR SPRING.—William F. Converse, Har- rison, Ohio.

I claim the combination of the concave heads, F F', double- faced collet, A, annular elastic disks, B B', and connecting bolt, c, all constructed and arranged to operate as and for the purposes specified.

56,717.—BROOM.—E. P. Cooley, New York City.

I claim the combination of the cords, A, having knotted ends B, the conical cap, C, and pointed handle, F, with the stalks ar- ranged and operating substantially in the manner and for the pur- pose herein represented and described.

56,718.—COMBINED CRADLE AND CHAIR.—Fethan do E. Coomes, Berlin, Wis.

I claim as my invention the extension bottom, A, as used in combination with the part, B, as arranged in connection with C, and the holes, F F, substantially as described and for the purposes specified.

56,719.—WATER WHEEL.—George E. Corbin and John W. Pugh, Grand Rapids, Mich.

We claim the combination of the buckets, b, and wheel, D, cylin- der, E, with chutes, c, and tube, F, all constructed as described, and winged spout, G, arranged and operating in the manner and for the purpose herein specified.

56,720.—TRUNK BRACE AND HINGE.—John J. Cow- ell, Chicago, Ill.

I claim the hinge composed of the parts, A and B, constructed substantially as specified, when used in combination with the bar, C, the parts operating as and for the purpose set forth.

56,721.—RAISIN SEEDER.—J. B. Crosby, Boston, Mass.

I claim the employment of closely-set wires in combination with a bed or presser, for the purpose of forcing out of raisins or sim- ilar dried fruit the seeds or stones thereof, by the impalement of the pulp of the fruit on the wires as specified.

Also, in combination with the above, of seed remover, or a pulp remover, or both, arranged to operate substantially as set forth.

56,722.—MILK AND CHEESE RACK.—John G. Cross, Brattleboro, Vt.

I claim the revolving rack, in sections, and the manner of en- closing rack in screen, with ventilators at top and bottom.

56,723.—MIRROR.—P. A. Daily, New York City.

I claim the combination of the handle, A, with the metal frame, C, glass and back, when constructed as and for the purposes and substantially as described.

56,724.—WATER CLOSET.—James N. Davis, Cincin- nati, Ohio.

I claim the vibratory seat, A, bearing a curved front piece, C, and side piece, c c, cover or screw, D, having arms, E E, hung to the arms, F F, with friction slide, f f, and the swinging platform, H, having levers, J J, or their equivalents, when arranged to- gether so as to operate substantially in the manner and for the purpose described.

56,725.—FURNACE FOR SMELTING COPPER.—John Davies, Baltimore, Ind.

I claim, in furnace for smelting copper, interposing between the hearth or interior of the furnace and the descending flue that leads into the tunnel, a metallic or other equivalent stopper or plug, to prevent the molten metal, should it break through at that point, from running into and choking up the tunnel, as described.

56,726.—RAILWAY CHAIR.—Nicholas L. Davis and Robert O. Hewitt, Rutland, Vt.

We claim the method, herein described, of joining rails, and holding the same onto the ties, by the employment, in combina- tion with chairs, C, or spikes, or their equivalent, of either of side plates, P, bolted or clamped together, substantially as herein shown and described.

56,727.—HOT-AIR FURNACE.—H. G. Dayton, Mays- ville, Ky.

First, I claim the concentric series of hot-air flues, a b c, in combination with the combustion chamber, e, and jacket, K, all constructed and operating substantially as and for the purpose described.

Second, The air-supply pipes, f g h, in combination with the hot-air flue, a b c, and combustion chamber, e, constructed and operating substantially as and for the purpose set forth.

Third, The water vessel, M, in combination with the concentric flues, a b c, combustion chamber, e, jacket, K, and tank, N, all constructed and operating substantially as and for the purpose described.

56,728.—CHURN DASHER.—George Deckman, Mal- vern, Ohio.

I claim an improved churn dasher, formed by the combination of the double concave disk, B, and the concave convex disk, C, with each other, and with the handle, A, the whole being con- structed and arranged substantially as herein described and for the purpose set forth.

56,729.—SEWING MACHINE FOR SEWING BOOTS AND SHOES.—Auguste Destoug, New York City.

I claim, First, The self-adjusting table or platform for the sup- port of the material to be sewed, the same being arranged to exert a yielding pressure against a sewing gage, substantially in the manner and for the purposes herein set forth.

Second, The combination of a wheel-feed in the adjustable plat- form or table, with an awl-feed, the two operating conjointly, in the manner and for the purposes set forth.

Third, I claim, in combination with a double-feed, as described, a dog to guide the work, in the manner and for the purposes set forth.

Fourth, The employment, in a sewing machine such as describ- ed, of adjustable standards to support the last, in the manner and for the purposes set forth.

Fifth, In combination with the herein described machine for sewing boots and shoes, a reservoir to contain wax, or other suit- able substance, together with a heater, substantially as and for the purposes set forth.

Sixth, The thread carrier, revolving intermittently in one direc- tion only, in combination with the hook, operating substantially as herein described and for the purposes set forth.

Seventh, In combination with the hook and awl, I claim the aux- iliary needle, when constructed and arranged for operation as herein shown and described.

56,730.—FEED MOTION FOR SEWING MACHINES.—Albert L. Dewey, Westfield, Mass.

I claim the spring, E, and hub, D, applied to shaft, A, substan- tially as shown, and all arranged to operate in the manner and for the purpose set forth.

56,731.—WRENCH.—J. F. Dodge, Newark, N. J.

I claim the double-jawed wrench, with one pair of the jaws eat- away to fit hexagonal nuts, and otherwise constructed substan- tially as described.

56,732.—APPARATUS FOR BLEACHING PULP AND DRYING PAPER.—Levi Dodge, Waterford, N. Y.

I claim, First, The method, substantially as herein described, of bleaching the straw or other paper stuff, in a revolving steam cylinder, and of drying the made paper, whereby these two operations are effected simultaneously in one and the same apparatus—the steam used to dry the paper on the cylinder serving at the same time to bleach the material in the cylinder, as set forth.

Second, The process herein described of drying paper in sheets, on a drying cylinder, in one revolution thereof; that is, by so regulating the velocity of the revolutions of the drying cylinder, with respect to its diameter, and the thickness of the paper operated on, that the paper being carried around the cylinder once may be dry and ready to be removed.

Third, The revolving cylinder, boiler, when the same is constructed with a smooth cylindrical surface, and one or more man holes in the sides or caps of the boiler for the introduction into and removal from the boiler, of straw or other paper material, as set forth.

Fourth, In combination with the said cylinder, or boiler, I claim the use of an endless apron, or band, and doffers for operation as a drying cylinder, substantially as set forth.

56,733.—WASHING MACHINE.—Augustus L. Drake, Richmond, Me.

First, The operating of the reciprocating rubber by means of the gearing, pitman, lever, and arm, the latter being connected to or applied to the rubber by a pivot and upright guide, arranged as shown, so that the rubber may work in place, or with a rocking motion, as set forth.

Second, The drum, N, and cord, L, in combination with the reciprocating rubber, I, spring, M, and cord, L, substantially as and for the purpose specified.

Third, The crank, J, in combination with the toothed plate, O, for retaining the drum, N, in position, as described.

56,734.—MODE OF REPAIRING FILES.—A. A. Dunk, Manchester, N. H.

I claim the process of sharpening and renewing files, substantially as above described, by covering the tops of the teeth only with a protecting coating, and then immersing the file in acid until the intervals are sufficiently deepened.

56,735.—ANIMAL TRAP.—A. Ellis and O. Albertson, Salem, Ind.

We claim the arrangement of the connecting rods, C C, platform, G, with its spring, H, shouldered spring-arm, I, trap door, O, and arm, P, with the boxes, A and M, operating in combination with the swinging doors, B, all constructed substantially in the manner and for the purpose herein specified.

56,736.—MACHINE FOR FORMING PLOW HANDLES.—W. A. Ellis, Ashtabula, Ohio.

I claim the groove, a, made adjustable by the removable piece, I, in combination with the sliding frame, B, and revolving cutter, arranged and operating substantially as described.

56,737.—PAPER CUFF OR WRISTBAND.—Andrew A. Evans, Boston, Mass.

I claim, as a new article of manufacture, a wristband or cuff, made of long fiber paper, substantially such as is above described. I also claim making said wristband or cuff reversible, substantially as and for the purpose described.

56,738.—STEAM CONDENSER.—John K. Ferguson, Portland, Ky.

First, I claim the cylinder, B, provided with a series of perforated pipes, C C, and valves, D D', and used with the exhaust pipe, A, and cold water pipes at a, substantially as and for the purpose specified.

Second, The box, E, provided with a series of chambers and valves as described, when used with the cylinder, B, and force pumps, M and L, substantially in the manner and for the purpose set forth.

56,739.—HORSE HAY FORK.—Henry Fisher, Canton, Ohio.

I claim the bars, A and B, with crooked points, being provided with the lever, C, when arranged and used substantially as and for the purpose herein set forth.

56,740.—BED BOTTOM.—John Flinn, Philadelphia, Pa.

I claim, in combination with a bed bottom, spiral spring, B C, extending and bending the wire of the bottom coil, b', of the same, so as to produce the spring clamps, b1 b2 c' c1 c2, substantially in the manner described and set forth, for the purpose specified.

56,741.—SPRING-BED BOTTOM.—A. Frazee and L. W. Smith, Canandaigua, N. Y.

We claim the combination and arrangement of the cross-bars, C C, cleats, E E, elastic bands, G G, and loop hooks, D D and H H, substantially as and for the purpose herein specified.

56,742.—PROCESS FOR MAKING BRICK.—Isaac H. Garrettson, Richland, Iowa.

I claim making brick, tile, and similar articles, by the "tamping" process—that is to say, by feeding in the clay or other material in small quantities, and tamping or beating each small quantity, thus fed in, before any more material is added, as herein set forth.

I also claim the mechanism, constructed and operating substantially as herein described, for the purpose of making brick and similar articles.

56,743.—STRAW CUTTER.—Alexander Gordon, Rochester, N. Y.

I claim the relative arrangement of the spring, s, with the yoke, y, the latter being pivoted to the frame of the machine by the pivots, g, which are located at a point intermediate between the bar, c, and the pivots, f, to which the supporting bars, r, are hinged, for the purpose set forth, the parts acting conjointly, in combination with the upward cut.

56,744.—WASHING MACHINE.—William Gowen, Warsaw, Wis.

I claim the washing machine, constructed as herein described, with cross-bar, D, sliding rods, e, e, sockets, d, springs, f, shaft, c, and rubbers, B, all combined and arranged to operate substantially as and for the purpose set forth.

56,745.—DIES FOR MAKING SQUARE BOLT HEADS.—James Gribben, Alleghany, Penn.

I claim the use of dies for making square-head bolts, the heading of which is enlarged, at two opposite corners, beyond the dimensions of the bolt-head to be formed, while the two remaining corners are of the required shape and dimensions, or shaped apart, in combination with a heading tool or plunger, so shaped as to fit closely into or against those last-named corners, while the remaining corners of the heading tool or plunger are enlarged, substantially as and for the purpose hereinbefore set forth.

56,746.—CUPOLA AND BLAST FURNACE.—John R. Grout, Detroit, Mich.

First, I claim constructing the boshes, B, of a cupola or blast furnace with metallic chambers, g, so arranged that a current of cold water may flow through them, and without an internal lining of fire-brick, or other refractory substance, substantially in the manner and for the purposes set forth.

Second, So arranging two or more chambers, g, in combination with each other, and with the perforated plate, A, substantially as described, and for the purpose set forth.

Third, The stripping tubes, D, constructed and arranged as herein described, in combination with the spring bars, C, and with

56,747.—SORGHUM STRIPPER AND CUTTER.—C. L. Hart, Mattoon, Ill.

First, I claim the use of the plate, A, in a sorghum stripper, when perforated, substantially in the manner herein described and for the purpose set forth.

Second, The frame or covering, B, and spring bars, C, in combination with each other, and with the perforated plate, A, substantially as described, and for the purpose set forth.

Third, The stripping tubes, D, constructed and arranged as herein described, in combination with the spring bars, C, and with

the perforated plate, A, substantially as described, and for the purpose set forth.

56,748.—STEAM GENERATOR.—David Greene Haskins, Cambridge, Mass.

First, I claim the combination of a series of perforated pipes with the exterior or heating surfaces of steam generators for the purpose of utilizing gases in the generation of steam, substantially as herein described.

Second, I claim the combination of the boiler, A, with the tubes, B B, and series of pipes, a and b, substantially as and for the purpose specified.

Third, I claim the combination of the boiler, A, the casing, E, and interposed series of pipes, b, substantially as and for the purpose specified.

56,749.—SICKLE HEAD FOR HARVESTER.—Milton H. Hilburn, Wilmington, Ill.

I claim a sickle head to be used in mowers and reapers, constructed substantially as described, with the conical journals, d, d, upon the lug, C, in the manner and for the purpose specified.

56,750.—PAINT BRUSH.—Emil Hiss, Delaware, Ohio.

I claim a paint brush, provided with an adjustable draw-band, C, substantially as and for the purpose specified.

56,751.—ROOFING.—Joseph F. Hodgson, Washington, D. C.

First, In the construction of metallic roofing I claim securing the edges of the sheets of metal in dovetail grooves by means of a fusible metal, substantially as described.

Second, The use of blocks, B, having beveled edges applied to the sheathing of the roof for the purpose of supporting the sheets of metal, and forming dovetail grooves for receiving the edges of said sheets, and also the fusible metals, substantially as described.

56,752.—TOBACCO PIPE.—Edwin Hoyt, Stamford, Conn.

I claim the sliding perforated tube, E, in combination with the perforated diaphragm, C, tube, D, and bore, a, substantially as and for the purpose specified.

56,753.—SPRING SEAT FOR CARRIAGES.—Francis M. Hubbard, Ripon, Wis.

I claim a device for giving elasticity to the seats of vehicles by means of the levers, D D, fulcrums, C, and elastic bands, E, combined and arranged substantially as and for the purpose set forth.

56,754.—CONSTRUCTION AND RIGGING OF TRESTLE TREES FOR VESSELS.—John M. Hudson, New York City.

I claim the placing below the upper trestle trees, A, a new pair of trestle trees, B, on the lower mast, X, with the projections, D, on the ends, and securing the trestle trees, B, with the iron band, U, and extending the top mast, Y, so that the heel, C, with fid, P, going through the heel, C, will rest on trestle tree, B, and take against the projections, D, instead of resting on the trestle trees, A, which now opens with the iron gate, F, to facilitate sending the topmast, Y, up and down, substantially in the manner as herein described.

I also claim the bridle band, E, over the masthead, as herein described.

I also claim the combination of the foregoing with the clew lines and spilling lines, for the purposes and objects herein described.

56,755.—FRUIT JAR.—William Hunt, New York City.

First, I claim the within described preserve can composed of a body of pottery ware and a cover of vitreous material, fitted to each as shown, and adapted to withstand the temperature of filling and to exhibit the contents without opening the can, substantially as herein set forth.

Second, I claim the ears, a, arranged on the neck or contracted of a pressure can, substantially in the manner and so as to form attachments for the links, D, as herein set forth.

Third, I claim the flexible links, D, adapted to operate in connection with the turning key, E, or its equivalent as described when said links are permanently attached so as not to be lost on unsealing the can, and are hinged so as to be turned down when out of use, substantially in the manner and for the purpose herein set forth.

Fourth, I claim the flat turning key, E, having portions cut away at e, in combination with a pressure can, A, and cover, B, and arranged to induce two different pressures upon the cover, by turning upward one edge or the other of the key, as and for the purposes herein set forth.

56,756.—DUMPING CAR.—Edward H. Jackson, Boston, Mass.

I claim, First, Attaching to the sides of a dumping car a hub or projection, D, as and for the purpose substantially as specified.

Second, I also claim the combination of a dumping car provided with a hub or projection D, on either side, with a frame, B, substantially as and for the purpose specified.

56,757.—SPRINKLING SYRINGE FOR GARDENS.—A. L. Jewell, Waltham, Mass.

I claim as my invention or improvement the combination and arrangement of the foraminous valve, its opening and seat with a syringe, the same being to operate substantially as described.

56,758.—WOOL-OILING MACHINERY FOR CARDING MACHINES, ETC.—Charles Jones, Boston, Mass.

First, In combination with carding or other kindred wool-preparing machinery and arranged over the feed apron of the same, I claim a dripping oil tank having a transverse motion with respect to the line of feed of the wool, substantially as set forth.

Second, In combination with carding or other wool-preparing machinery and arranged over the feed apron of the same, I claim a dripping oil tank having both a transverse motion with respect to the line of feed of the wool and a rotary movement, substantially as set forth.

56,759.—MANUFACTURE OF SHEET AND BAR IRON.—Jonathan M. Jones, East Taunton, Mass., Bernard Spaulding, Port Richmond, N. Y., and Sylvester Parkins, Providence, R. I.

We claim the improved process for the manufacture of iron, substantially as herein described and for the purposes set forth.

56,760.—RAILROAD RAIL.—Robert V. Jones, Canton, Ohio.

I claim the top rail provided with a tongue, E, upon each side of which are V-shaped grooves, said tongue being made concave on its side below its center and decreasing in size or width from z, z, to a, when used with the flanges, D D, with beveled edges, and straight sides, substantially as and for the purpose herein specified.

56,761.—WASHING MACHINE.—Wm. and A. G. Kelsey, Delevan, Wis.

We claim the combination of the hinged roller block, a, a, and the swinging rubber, c, with the wash tub, A, A, for the purpose of converting it when desired into a rinsing tub, arranged and operated as herein specified.

56,762.—BRIDLE BIT.—Samuel M. King, Lancaster, Pa.

I claim the extended ends, D, constructed with grooved rollers, E, and round aperture, J, as herein described and for the purposes set forth.

56,763.—BILGE WATER GAGE.—William P. Kirkland, San Francisco, Cal.

I claim, First, The aprons, C, applied to the perforated star board and bar board sides of the box, A, substantially as and for the purpose described.

Second, The disk, f, of glass or other suitable material in combination with the float, B, and index rod, g, constructed and bination with the float, B, and index rod, g, constructed and operating substantially as and for the purpose specified.

56,764.—SAD IRON.—Christian F. Knauer, and Wm. Warwick, Pittsburg, Pa.

We claim the method of constructing sad irons, substantially as herein specified and set forth.

56,765.—METHOD OF PREPARING GOLD FOR DENTISTS.—Emile Lamm, New Orleans, La.

I claim the use of saccharine substances to precipitate gold from its solutions in the manner and by the process above described, or by any substantially equivalent process, thereby forming a mass of chrysal shreds, extremely useful and convenient for dental and other purposes.

56,766.—FIELD FENCE.—John W. Lamore, Harrison, Ohio.

I claim, First, The metallic post, A, having the vertical series of flexible ears or clips, D, to receive and secure the wires in the manner described.

Second, A field fence composed of the following elements, to wit: a metallic post, A, having a bottom tenon, B, to enter a stone foot or base, F, and a top tenon, C, to enter a wooden rider, G, and having a series of ears or clips, D, for the reception of suitable wires, E.

56,767.—BELT COUPLING.—Worley Leas, Kokomo, Ind.

First, I claim a belt coupling consisting of a link, D, and bent metallic plates, E E, connected together so as to form a joint at each side of the link, substantially in the manner specified.

Second, I claim the rib or back, D', formed on the link, D, and employed to form a continuous bearing for the leather as described.

Third, In combination with a belt coupling constructed as herein described, I claim the leather covering F F', and G, to prevent slipping when the coupling is upon the pulley.

56,768.—QUARTZ CRUSHER.—A. Lindsay, Malone, N. Y.

I claim, First, The combination of the rollers, E, with the axles, e, pins, f, and upright shaft, B, substantially as set forth and in the manner described.

Second, The combination of brushes or scrapers, G, with bars, g and g', springs, g', friction rollers, g', rollers, j' and cams, j, substantially shown and described.

Third, Returning the coarse quartz to the crusher by means of sieves or separators, n, trough n', box, M, endless apron, N, hopper, J, and pipe, t, substantially as shown and described.

Fourth, The devices for raising and lowering the brushes or scrapers, c, consisting of cam, j, rod, i', shell, i', and spiral spring, i'', substantially as herein shown and described.

56,769.—TABLE AND STOOL.—Henry Loth, Philadelphia, Pa.

I claim the described folding table or stool, having its three legs, C D E, and top A B, combined as shown and relatively arranged to fold up in the order and for the purpose set forth.

56,770.—EXTINGUISHER AND REGULATOR FOR LAMPS.—C. E. Lyon, Worcester, Mass.

I claim, First, A lamp burner provided with a combined regulator and extinguisher, substantially such as herein described, as a new article of manufacture.

Second, I claim the sleeve, C, adapted to act separately as a regulator and in combination with the cap, E, as an extinguisher.

Third, The cam shaft, D, and hook, c, with its shoulder, d, in combination with the sleeve, C, wick tube, B, and cap, E, constructed and operating substantially as and for the purpose described.

56,771.—GEARING FOR CHURNS.—Alvin C. Mason, Springfield, Vt.

I claim, First, The gear wheel, B and H, in combination with the pinion, I, so that the motion of the beaters may be reduced or accelerated for the purpose and substantially as described.

Second, I claim the plate, D, or its equivalent in combination with the wheels, B and H, and pinion, I, substantially as herein set forth.

56,772.—OPERATING HAND PUNCHES, SHEARS, ETC.—Wm. B. Mason, Boston, Mass.

I claim the above described machine for operating punches, dies, shears, etc., the combination and arrangement of the levers, A and B, with the link, C, substantially as described.

56,773.—CLOTHES WASHER.—Ariadna B. Mercier, Providence, R. I.

I claim the combination of a perforated plate with a stopper in the manner set forth and for the purpose specified.

56,774.—STOVEPIPE DRUM.—B. F. Miller, New York City.

I claim the radiating drum, c d, and interior chamber, e, with the pipes, g h, constructed substantially as and for the purposes specified.

56,775.—ATTACHING BURNERS TO LAMPS.—Warren P. Miller, San Francisco, Cal.

I claim the application of the grooved shank, c, as shown at d, the socket, b, and springs, s, or their equivalent when made to operate substantially in the manner described.

56,776.—POCKET TABLET.—J. A. Minor, Middletown, Conn. Antedated July 19, 1866.

I claim a case for a pocket calendar constructed with two elastic or yielding sides, a a, one of which is provided with a pin, d, to pass through and secure a series of cards, B, to the case so that said cards may be turned within and out from the case and readily adjusted to and detached from the same, substantially as described.

I also claim the rounded back, p, when used with the yielding or elastic sides, a a, to serve as a socket for the pencil, c.

I claim the blank, A, as represented in Fig. 4, for the purpose specified.

56,777.—BRIDGE.—David A. Mitchell, Chicago, Ill.

I claim, First, Suspending the draw for bridges from trucks which run on a railway supported on frame work by suspension cables on towers, placed either above or below the frame work, at a height sufficient to allow steamboats and other river craft to pass freely under the structure that supports the draw as herein described.

Second, I claim the collar braces, F F, constructed and arranged as and for the purposes specified.

Third, I claim so placing the stirrups, suspension rods, and angular braces, that the strain upon the draw and the other portion of the bridge structure is equalized upon the suspension cables, in the manner and for the purpose herein set forth.

56,778.—STEAM GENERATOR.—Thomas Mitchell, Albany, N. Y.

I claim the arrangement of the stem, B', and beam, C C, of Fig. 3, and cock, B, of Fig. 2, substantially as and for the purpose set forth.

56,779.—CORRUGATED METALLIC PLATES.—Richard Montgomery, New York City.

I claim the plate or plates of rolled wrought metal doubly corrugated, substantially as described.

56,780.—APPARATUS FOR COOLING MILK.—J. Owen Moore, Washingtonville, N. Y.

I claim, First, Forming a spiral channel for the purpose set forth by inserting a coiled wire, a, between the walls of the vessels, B and C, substantially as shown and described.

Second, An apparatus for cooling milk or other liquids, formed by combining with each other the vessels, A B and C, pipe, e f and h, trough, i, strainer, k, coiled wire, a, and pipe, g, substantially in the manner and for the purpose herein shown and described.

Third, Constructing a cooling apparatus in such a manner that the cooling liquid may overflow from the inner vessel, C, to the outer vessel, A, without coming in contact with the milk contained in the intermediate vessel, B, substantially as and for the purpose shown and described.

Fourth, The combination of the annular trough, i, with the strainer k and vessels B and C, substantially as described.

56,781.—POLISHING BOX.—William A. Moore, Philadelphia, Pa.

I claim a polishing pad substantially as described in combination with a box having a perforated lid for the purpose specified.

56,782.—BEE HIVE.—M. D. Mulford, Jr., New Providence, Iowa.

I claim, First, The hive, A, having its top and bottom inclined as shown, with its lower walls made double, and provided with the movable frames, C, having their top bar inclined as set forth. Second, The additional mouth piece, e, provided with the opening m, in combination with the piece, a, having the opening, m, when said pieces are arranged in relation to each other, and to the hive as shown and described.

56,783.—PORTABLE APPARATUS FOR HEATING AND MELTING ROOFING MATERIAL.—John Munn, Columbus, N. J.

I claim, First, The pan, B, and fire box or cylinder, C, so arranged relatively to each other as to form an intervening air chamber, e, between them, whereby the air is heated and applied to the pan instead of a direct flame as heretofore, substantially in the manner and for the purpose as herein set forth.

Second, The sliding valves, F, F', in combination with the box, A, and air chamber, e, for regulating the degree of heat in its application to the pan by the admission of cold air, substantially in the manner as described.

Third, The arrangement of the pipe, D, the fire box, C, and pan, B, substantially in the manner and for the purpose as described.

56,784.—CONDENSING STEAM.—F. Murgatroyd, Cleveland, Ohio.

I claim, First, The chamber, D, funnel-shaped pipe, B', and valve, e, combined with the device for discharging bilge water, arranged in the manner, and for the purpose set forth.

Second, The arrangement of the connecting rod or link, d, cranks, h and b, and valves, e, a, for the purpose of automatically exhausting into the chamber, D, below the water line, or out board, according to the direction of the vessel, in manner and for the purpose as described.

Third, The chamber, D, funnel-shaped pipe, B, and valves, e, a, combined with a device for discharging bilge water, as and for the purpose set forth, below the water line.

56,785.—BUCKLE.—Nicholas Murphy, Washington, D. C.

I claim the combination and arrangement of the two pieces, A and B, when the tongue, a, and pivots, b, are arranged as specified, substantially as and for the purposes set forth.

56,786.—SASH FASTENING.—H. Naylor, Pekin, Ill.

I claim the combination of the catch, C, with its head, b, and spring, d, arranged with the piece, a, applied and operating substantially as specified.

56,787.—HOOP SKIRT.—Caesar Neumann, New York City.

I claim the hoop skirt having its wires arranged in sections or clusters, each section comprising two or more wires placed near together, in separate pockets, substantially as described, as a new article of manufacture.

56,788.—WOOD-BENDING MACHINE.—Joseph Newman, Falmouth, Maine.

I claim operating the mold, C, or form for bending, by means of the metallic bending strap, f, which is attached to the mold at one end and to the reciprocating rack, g, at the other, all constructed to operate substantially as described.

56,789.—STOVEPIPE DAMPER.—William H. Nutting, Orange, Mass.

I claim the combination and arrangement of the series of starts, d d d, and the series of notches, g' g' g', with the damper and register slide, and the swell, D, and the journal, C, applied to the damper, as set forth.

56,790.—SAFE LOCK.—Alfred A. Oat, Philadelphia, Pa.

First, I claim the interlocking spring slides, 2, and 5 7, and 11 13, and 15 and 18, constructed and arranged in relation to each other, and to the sliding blocks, K K K K, which are respectively connected to the sliding spring stops, F F F F, substantially in the manner described for the purpose of operating the said stops, and thus fixing and releasing the said main bolts E E E E, of the lock, as described.

Second, I claim securing the plug, 2, in the plate, B, of the lock, by means of the interlocking spring slides, 1 3 4 6 8 9 10 12 14 17, when the same are arranged in relation to each other, and to the interlocking spring slides 2 and 5 7 and 11 13 and 15 and 16 and 18, substantially as described and set forth.

Third, I claim retaining or fastening the plug 1', in the plate, C, by means of the rack bolt, J, operated by means of the pinion, H, spring, J', and spring slide, 19, substantially as described and set forth.

Fourth, I also claim securing, releasing, and supporting in its retracted position, while holding back the four main bolts, E, as described, the retracting plug, O, by means of the two spring bolts, J' J', cam, J3, and slide, 20, the same being constructed and arranged to operate together substantially as described.

56,791.—MANUFACTURE OF INITIAL STUDS.—Abraham W. Overbaugh, New York.

I claim the application of the changeable initial plate in the manufacture of buttons, pins, ear-rings, and other jewelry or ornaments generally, as herein above described.

56,792.—WATER COOLER.—George T. Palmer, Brooklyn, N. Y. Antedated July 20, 1866.

I claim the reservoir, c, cooler, d, and pipes, e, g, combined and arranged substantially as and for the purpose shown and described.

56,793.—QUARTZ CRUSHER.—Henry Pearce, San Francisco, Cal.

I claim the construction of a conically-shaped crushing mill with an eccentric motion as herein described, for the purpose and in the manner substantially as set forth.

56,794.—CORSET.—Samuel M. Perry, Plainfield, N. J. Antedated July 20, 1866.

I claim a corset having one or more jointed clasp plates, so constructed essentially as herein specified, that the top ends of said clasp plates may swing outward and downward when the tops of said plates are unhooked and afford a ready access to the parts of the wearer's person thereby exposed, while the bottom ends of said clasp plate serve to clasp the corset sufficiently when the top is unhooked.

56,795.—TOBACCO PIPE.—J. W. Petty, New Orleans, La.

I claim the combination of the sections of the bowl and stem, A, d, and of the mouthpiece, e, with the framework, a b c f, when the several parts are constructed and united as described, for the purpose set forth.

56,796.—STEAM GENERATOR.—William Phelan, Peoria, Ill.

In combination with an outer jacket, I claim the removable arrangement of fire-box, double set of flues, and flue chamber, O, so attached to the outer shell as to permit the space between them to be used as a water and steam chamber, I.

In combination with the said shell surrounding the said removable arrangement, I claim steam chambers, A B, on the sides of the boiler, substantially as described.

56,797.—APPARATUS FOR PURIFYING AND DEODORIZING WHISKY, ETC.—E. F. Prentiss, Philadelphia, Pa., and C. C. Parson, Boston, Mass.

I claim, first, the distributor, H, constructed and arranged in the manner and for the purpose substantially as shown and described.

Second, The shield, F, constructed and arranged in the manner and for the purpose substantially as shown and described.

Third, The pipe, b, arranged and operating in the manner and for the purpose substantially as shown and described.

Fourth, The trap tube, a, provided with a distributor, H, and

the tank, C, containing neutral materials, in combination with the shield, F, and the pipe, b, or their equivalents respectively, substantially as described, the whole to be used in connection with a still.

56,798.—PLOW.—Benjamin Price, Leesville, Ohio.

I claim the jointed beam, A A', attached to a front and rear mold-board, and points or hill-side plow, constructed and operating substantially in the manner and for the purposes set forth.

56,799.—VENTILATOR AND SHADE FOR LAMP.—Karl Recht, New York.

First, I claim the valve arranged and described substantially.

Second, The combination of the valve and shade with the ventilating tube as constructed.

56,800.—PROTECTOR FOR CORNERS OF STAIRS AND ROOMS.—Henry C. Richards, Cincinnati, Ohio.

I claim, as an article of manufacture, the corner protector, constructed of metal, wood, or other suitable material, as and for the purpose herein described.

56,801.—TRAVELING BAG.—William Roemer, Newark, N. J.

I claim a frame for traveling bags, having staples, J, and strap, E, adjusted on the top thereof, relieving the lock from strain as described, constructed, combined, and arranged as herein specified.

56,802.—STEERING APPARATUS.—Edward Rowze, Augusta, Maine.

I claim the arrangement of the rib, c, ropes, f, f, sheaves, 11, tiller, h, pulleys, K, and rudder head, B, with its pivoted stud, d, operating in combination with the windlass, E, in the manner and for the purpose herein specified.

56,803.—HOOP SKIRT.—Julius Schleisinger, New York City.

I claim, first, The combination of the adapter, E, with the hoops, B B', and strips, a, constructed and operating substantially as and for the purpose described.

Second, Turning the ends of the hoops, B', up and securing them to the strips, a, substantially as and for the purpose set forth.

56,804.—REVOLVING CARTRIDGE BOX.—P. F. Schneider, Hartford, Conn.

I claim, first, The stationary bridge, W, in combination with the casing, D, and sections, F E, arranged relatively with the discharge opening, V, applied and operating substantially as and for the purpose represented and described.

Second, In combination with the shaft, I, and sectional tube cylinder, C, the ratchet wheel, M, spring pawls, N O, and lever, Q, constructed and operating substantially as described for the purpose specified.

56,805.—SEWING MACHINE.—M. Schwalbach, Milwaukee, Wis.

First, I claim the combination of the take-up rod, d, with the needle bar, when it is rigidly fastened to a rotating pin or pivot placed in the top of said bar, and loosely fitted to slide in a rotating pin or pivot placed on a standard, r, substantially as and for the purpose above described.

Second, I also claim the elbow feeding lever, N, carrying an adjustable feed propelling screw at its upper end, and having curved branches, O P, on its lower end, between which the crank pin of the shuttle carrier vibrates, substantially as set forth.

Third, I also claim the combination of the shuttle carrier, the feeding plate, R, and the elbow lever, N, the whole operating in conjunction substantially as described.

Fourth, I also claim the plate, V, constructed substantially as above described, for holding up to the curtain, U, the shuttle carrier for holding the feed plate, R, in proper position, and for moving the feed plate backward when it is in its lowest position, substantially as described.

56,806.—SHOE STRING FASTENER.—Eliphalet S. Scripture, Williamsburg, N. Y.

I claim a shoe string fastener, composed of a tilting spring button, A, corrugated spring, washer, B, and rivet, C', substantially as and for the purpose set forth.

56,807.—METHOD OF COMPRESSING, CONDENSING, AND EXTENDING METALS.—John F. Shearman, Brooklyn, N. Y.

I claim, first, The percussive condensation, or extension, or both together, of solid or hollow bodies, commonly called hammering, when effected by the intervention of practically non-elastic fluids or liquids between the hammer and the body to be operated on, substantially as set forth.

Second, I claim the operation of the hydraulic hammer whether it be applied to change or not to change the shape of the article to be treated.

56,808.—LOCK.—George A. Sherlock, Boston, Mass.

I claim the application of each or either of the locks, G H, to the knob spindle of the spring bolt, B, so as when the bolt, g, of the lock is thrown forward, it shall lock the spindle or prevent it from being revolved by force applied to either of the knobs.

I also claim the combination of the spring bolt and its spindle with two isolated locks arranged on opposite sides of the door, and constructed in the manner and so as to operate with the spindle, substantially as specified.

56,809.—LOUNGE.—Abraham & David Short, West Liberty, Ohio.

We claim the combination of the leg, C, rod, D, and pawl rod, E, with the back, A', for adjusting the position of the latter, substantially as shown and described.

56,810.—CAR STARTER AND BRAKE.—Thomas R. Sinclair, New York City.

First, I claim the employment or use of the collars, Q Q, one or more placed on the shaft, F, in combination with the nut, P, and the screw, g, on shaft, F, substantially as and for the purpose set forth.

Second, The clamps, R R, with or without the teeth, 1 1 1, one or more in combination with the collars, Q Q, and nut, P, all placed on shaft, F, and arranged substantially as and for the purpose specified.

Third, The arched bars, b b, in combination with the frame, E, shoe or brake levers, S, and arms, i, all arranged in the manner and for the purpose specified.

Fourth, I claim the pivots, c, in combination with the levers, J, and arched bars, b, substantially as and for the purposes stated.

Fifth, The shoe levers, S, applied to the frame, E, as shown, and provided with springs, Z, and stops or pins, n, substantially as and for the purpose set forth.

Sixth, The eccentrics, A', applied to the springs, Z, for the purpose of graduating their pressure, as described.

Seventh, The operating of the shoe levers, S, from the shafts, W, by means of the chains, V, rods, U X, chains, Y, and pulleys, m, m, all arranged to operate substantially in the manner and for the purpose specified.

Eighth, An elastic lever, J', in combination with the lever, J, substantially as and for the purpose set forth.

Ninth, In combination with the levers, J J', I claim the draught hooks, O, constructed in the form of a fork, or branched to admit of the levers, J', passing them as described.

56,811.—BUCKLE.—Earle A. Smith and Dwight L. Smith, Waterbury, Conn.

We claim the combination of the bar, e, of the lever with the bar, B, of the frame, whether the eye parts of the hinges are on the lever part (as in Figs. 1 2 and 4), or on the frame part (as in Figs. 5 6 and 7), when the bar, e, is made to pinch the running part of the strap between itself and the edge, or reverse, or under corner of the central bar, B, of the frame, and the buckle is constructed and fitted for use, substantially as herein described and set forth.

56,812.—SCUTTLE.—George Smith, Brooklyn, N. Y.

I claim a coal cuttle composed of three removable parts, when constructed and arranged substantially as and for the purpose herein described.

56,813.—WEATHER STRIP FOR DOORS.—John A. Smith, Wapuca, Wis.

I claim a threshold weather strip made of the two parts, a and

b, with edges convex and concave, as described, when united by hinges operating also as springs, substantially as specified.

56,814.—PAINT.—Rees B. Smith, Mount Pleasant, Ohio.

I claim the compound as a new and useful composition for paint.

56,815.—COMPOSITION FOR WELDING AND BRAZING.—Rees B. Smith, Mount Pleasant, Ohio.

I claim the fluxing or welding composition substantially as described.

56,816.—HEATING APPARATUS.—Sidney Smith, Greenfield, Mass.

I claim First, A fire chamber constructed in accordance with the principles, and substantially in the manner herein set forth.

Second, The combination of the perforated walls, A and G, constructed as described, to form a fire chamber.

Third, The combination of the perforated walls, A and G, with the close bottom, B, substantially as and for the purpose set forth.

Fourth, The combination of the perforated walls, A and G, with the partition, E, and damper, M, substantially as and for the purpose set forth.

56,817.—COMPOSITION FOR FACING MOLDS.—Rees B. Smith, Mount Pleasant, Ohio.

I claim the composition above described, as a "facing" powder, for use in the process of casting.

56,818.—COMPOSITION FOR ROOFING.—Rees B. Smith, Mount Pleasant, Ohio.

I claim the composition for roofing, consisting of the ingredients in about the proportions described.

56,819.—PEG HOLDERS.—William H. Smith, Sparta, Wis.

I claim the hoops, E, and hinged hopper, C, arranged to operate substantially as set forth.

56,820.—MORTISING MACHINE.—Jerome B. Stark, Fisherville, N. H.

I claim the feeding mechanism or combination as described, the same consisting of the two racks, e f, the pawls, p p, the pawl levers, E F, the lifter, G, and the cords, r r, the whole being arranged and applied as explained to the supporter, B, the frame, C, the chisel shaft, and its operative lever, connected with the said shaft by means of the recessed block, K, and the spring catch, as specified.

56,821.—SAFETY POCKET.—P. A. Stecher, New York City.

I claim, First, The partition seam, a, and rounded or inclined seam, b, in combination with the pocket, A, and its mouth, B, substantially as and for the purpose described.

Second, The recess, d, in combination with the stop, D, and pocket, A, constructed and operating substantially as and for the purpose set forth.

56,822.—BOG CUTTER.—Charles E. Steller, Chicago, Ill.

I claim, First, The frame, A A' B B', constructed and arranged substantially as and for the purpose set forth.

Second, The arrangement of the cutters, D, in four or more transverse rows, two of the rows inclining to the right and rear in alternation with two inclining to the left and rear, the rear rows cutting through the spaces left by the front rows, substantially as set forth and shown.

Third, The combination of a frame, A A' B B', constructed substantially as specified, with transverse rows of obliquely placed cutters, or cutter teeth, the rows inclining alternately to the right and left, substantially as set forth and shown.

Fourth, The combination and arrangement of the brace bars, C, the beams or bars, A A' B B', and the oblique cutter teeth, D, substantially as shown, set forth and specified.

56,823.—DRYING APPARATUS.—Andrew Stevens, West Milton, Ohio.

I claim, First, The arranging the cleats, I, and trays, J, of a drying apparatus, so that they may form one side of a hot air flue, L, as described.

Second, The vertical cold air passage, H, when placed between the smoke pipe and housing of a drying apparatus, substantially as described, for the purpose set forth.

Third, I claim in the described combination the vertical cold air passage, H, smoke pipe, E E' F, and the concave deflecting plates, D and G, arranged and operating as explained.

Fourth, The horizontal branch, F, when arranged to pass between two sets of drying trays, as and for the purpose set forth.

56,824.—PRESS FOR CIDER MILL.—Michael Stevens, Smithville, Ohio.

I claim the conducting board, H, when constructed and used in a press box, substantially as described and for the purposes set forth.

56,825.—MACHINE FOR ROLLING METAL.—A. C. Stone, Steeleville, Pa.

I claim the combination of the dies, D D, with the rolls, C C, constructed and operating as described and for the purposes already set forth.

56,826.—FENCE.—John Stone and Samuel Blocker, Sr., Plattsburgh, N. Y.

I claim, First, The construction, combination and arrangement of the sills, A, uprights, B, braces, G, and wedges, D and H, with each other, substantially as described and for the purposes set forth.

Second, The combination of the horizontal bars, C, and blocks, E, with each other and with the upright bars, B, substantially as described and for the purpose set forth.

Third, The combination of the keys, F, or equivalent, with the upright bars, B, and with the upper horizontal bar, C, substantially as described and for the purpose set forth.

56,827.—PAPER COLLAR.—Samuel S. Stone, Troy, N. Y.

I claim, First, A paper or combined paper and-cloth turn-over shirt collar, having its neck band, B, slitted in the manner substantially as and for the purpose set forth.

Second, A turn-over shirt collar of paper, or paper and cloth combined, having only the exterior surface of turn-over part, A, colored or ornamented, as specified.

Third, The slitted neck band, B, provided with button holes, C, of the form shown, substantially as and for the purpose specified.

56,828.—ADJUSTABLE LOCK KEEPER.—Turner Strobridge, Pittsburg, Pa.

I claim, First, The oblong or slotted screw holes, b b, when used for the double purpose of adjusting a keeper, and fastening the same to the casing of the door.

Second, The combination of a movable face plate and stationary body of a keeper with slotted and regular screw holes, and ratchets or stops forming a keeper, substantially as shown and described.

56,829.—SELF-ACTING MULES.—James Sutherland, East Hampton, Mass.

I claim First, Controlling the ascent of the faller wire in spinning machines by the resistance of a body of confined air, substantially as above described.

Second, I also claim in combination the cylinder, E, having its lower end open and a valve applied to its upper end, the lever, I, and the arm, B, projecting from the shaft of the faller wire, C, substantially as described.

Third, I also claim the combination of the tripping rod, H, with the piston, T, table, G, and the arm, B, of the faller wire shaft, substantially as described.

Fourth, I also claim the screw rod, R, and nut, G, in combination with the tripping rod, H, and lever, I, substantially as described.

Fifth, I also claim the screw rod, R, and nut, G, in combination with the piston, whose stroke is shortened by the rising of the nut, substantially as described.

Sixth, I also claim the combination of the arm, B, of the faller wire shaft with the tripping rod, H, and lever, I, substantially as described.

56,830.—WASH BOILER.—Mary A. Taylor, Cincinnati, Ohio.

I claim a plurality of receptacles, D F, each constructed with a perforated bottom and adapted to fit within a wash boiler and operate in connection with each other in the manner and for the purposes herein described.

56,831.—TRUSS.—Charles Wesley Thompson, Batavia, Ill.

I claim, First, Making a truss pad of two separate pieces secured side by side to a plate on which they are allowed to oscillate, substantially as set forth.

Second, I also claim the screw threaded curved arm, D, passing through a guide and stop, G, and having a nut, F, thereon, substantially as described.

56,832.—PROCESS FOR THE MANUFACTURE OF PAPER STOCK.—Joel Tiffany, Albany, N. Y.

I claim, First, The employment of pressure obtained by forcing into the vessel containing the stock to be treated, air cold or hot, so as to obtain any degree of pressure necessary to force the caustic liquor into contact with every part of the stock, in combination with the caustic liquor so used, substantially in the manner and for the purpose above set forth and described.

I claim, Second, The use of condensed cold air forced into the vessel containing stock producing the necessary internal pressure upon the stock by heating and expanding the air within the vessel, in combination with the caustic liquor so used, substantially in the manner and for the purpose above set forth and described.

56,833.—BLEACHING PAPER STOCK.—Joel Tiffany, Albany, N. Y., and Harrison B. Meech, Fort Edward, N. Y.

We claim the process of bleaching paper stock under pressure produced by forcing a weak chlorine gas, with or without atmospheric air, into a close vessel containing the stock, in combination with the use of a solution of chlorine with which the stock to be bleached is saturated, substantially in the manner and for the purpose above described.

56,834.—PADDLE WHEEL.—C. A. Todd, New York City.

I claim the arrangement of the curved floats, B C, in combination with the radial arms, D, constructed and operating substantially in the manner and for the purpose specified.

56,835.—WATER WHEEL.—Jesse Tucker, Adrian, Mich.

I claim a horizontal water wheel provided with a bottom having a series of inclined flanges, D, and also provided with an upright rim or flange, E, having a series of curved taper flanges, F, in connection with the conical hub, G, on shaft, B, and the cylinder, A\*, over the wheel, all arranged substantially as shown and described.

56,836.—SAFETY ATTACHMENT FOR GAS PIPE.—L. W. Turrel, Samuel Stanton, and L. C. Ward, Newburgh, N. Y.

I claim the combination of the gauze disks, C C C, rings, D D, and coupling, A B, arranged and applied in the manner and for the purposes specified.

56,837.—CAR COUPLING.—W. Van Valkenburgh, Smithville, N. Y.

I claim, First, The arrangement of the springs, I J, rod, C, springs, E, pivoted draw head, B, and spring, L, in combination with the frame of the car, substantially in the manner and for the purpose herein described.

Second, The pivoted draw head, B, and spring, L, operating in combination with the curved catch, Q, and sliding frame, M, constructed and arranged in the manner and for the purpose specified.

Third, The combination and arrangement of the pivoted draw head, B, spring, L, springs, I J, spring, E, sliding rod, C, sliding frame, M, link, N, and lever, O P, constructed and operating substantially as and for the purpose herein represented and described.

56,838.—NAIL HAMMERS.—W. G. Ward, Savona, N. Y.

I claim holding the nail by means of the groove in the hammer, in combination with the head block and spring, when constructed to operate substantially as described and for the purpose set forth.

56,839.—CORN PLANTER.—David R. Warfield, Muscatine, Iowa.

First, I claim constructing the driving wheel, G, with spurs, I, when used in combination with the cams, H H, and levers, R R, for actuating the sliding seed valve of a corn planter, substantially as set forth.

Second, In combination with the spurs, I, the plates, K, arranged substantially as and for the purposes set forth.

Third, The combination of the wheel, G, and spurs, I, and frame, A, with the frame, B, and seat, L, substantially as and for the purposes set forth.

Fourth, In combination with the wheel, G, and spurs, I, the track cleaner, Q, substantially as and for the purposes set forth.

Fifth, The levers, R R, in combination with the supports, N, and lever, P, substantially as and for the purposes set forth.

56,840.—TOOL AND REST HOLDER FOR LATHES.—James Wolfenden, Jersey City, N. J.

I claim the combination of the slotted plate, B, tool holders, C, with segmental threads gearing in scroll, D, and plate, A, provided with the adjustable guide slides, E, when arranged and operating in the manner and for the purpose herein described. Also the segmental slots, a, in the bracket, B, for the purpose set forth.

56,841.—SLIDE VALVE.—A. H. Woodruff, Lansing, Iowa.

First, I claim the angular valve, either double acting or single acting, in combination with a correspondingly angular seat, substantially as and for the purpose described.

Second, The recesses, F F, in the exhaust side of the valve seat, in combination with the angular valve, substantially as and for the purpose set forth.

Third, The recesses, e e', in the steam side of the valve seat, in combination with the angular valve, substantially as and for the purpose set forth.

56,842.—FURNACE FOR DESULPHURIZING ORES.—Thomas D. Worrall, Central City, Col. Ter.

I claim, first, In a desulphurizing furnace, used in combination with a steam engine, to operate a blower or quartz pulverizer, or both, so combining and arranging the steam generating furnace with the desulphurizing furnace, that the flame and other products of combustion escaping from the steam generating furnace shall pass into and through the desulphurizing furnace and supply the flame and heat necessary for effecting desulphurization therein, substantially as described.

Second, I claim condensing flame by means of a blow pipe or pipes upon a hearth over which pulverized quartz is passed for the purpose of desulphurizing the same, substantially as described.

Third, I claim, in combination with a hearth upon which flame is condensed by means of a blow pipe or pipes, for the purpose herein described, a fan blower air pump, or other suitable air generator, for the purpose of forcing air through said blow pipe or pipes to condense the flame upon the hearth, substantially as described.

Fourth, I claim an inclined or zig-zag flue, with top of soap-stone, metal, or other suitable substance, for the purpose of securing a heated surface over which pulverized quartz is passed, for the purpose set forth.

Fifth, I claim the horizontal flue, I, with top plate of soap-stone, metal, or other suitable substance, in combination with the stirrer or scraper, L, for the purpose described.

Sixth, I claim the hopper, B, in combination with the worm screw, L', and the stirrer or scraper, L, substantially as and for the purpose described.

Seventh, I claim the hopper, B, in combination with the flue, J J, under the same for the purpose of drying and heating the pulverized quartz before leaving the hopper.

Eighth, In combination with the stirrer or scraper, L, and the

horizontal flue, I, I claim the apertures, O (one or more) through both the top and bottom plates of said flue, for the purpose of delivering the pulverized quartz down upon the heated plate covering the inclined flue, H, substantially as and for the purpose set forth.

Ninth, In combination with the hearth, G, I claim the sluice or watercourse, W W, for the purpose of conveying the pulverized quartz from said hearth to a buddle, arasta, or shaking table, as described.

56,843.—APPARATUS FOR THE MANUFACTURE OF GAS FROM PETROLEUM.—William C. Wren and William Barker, Brooklyn, N. Y.

We claim the process herein described of producing gas, to wit: by a combination of one or more heaters and super-heaters (not less than one of each) continuously connected with each other by pipes, such heaters and super-heaters fitted and filled as described in the foregoing specification, and by the peculiar combination, arrangement, and graduation of two or more fires, not less than two, as shown in specification, with an addition of more heaters, super-heaters, and fires, as the quantity of gas to be produced may require.

56,844.—SPRING BED BOTTOM.—J. E. Wilsey, Chicago, Ill., and D. Forbes, Scotland, Great Britain.

We claim the end rails, B B, in combination with upper and lower frames, and the notched crossed slats, F F, in combination with spiral springs, G G, the whole arranged substantially as above described and specified.

56,845.—EGG BEATER.—Leonard B. Alden (assignor to John Walker), Cincinnati, Ohio.

I claim the combination of the plate, D, lever, L, rack, K, pinion, I, shaft, G, and lug, F, all constructed and arranged to operate substantially as and for the purposes set forth.

56,846.—BREACH-LOADING FIRE-ARM.—A. M. Bacon (assignor to himself and George E. H. Day), Washington, D. C.

I claim the oscillating chambered breech block plunger and magazine combined, as constructed and arranged with the hammer operating against the rear end of the chamber, and the mode of oscillating the same by the diagonally grooved wheel, as described.

56,847.—BRICK MACHINE.—E. P. H. Capron and J. F. Winchell (assignors to themselves and T. W. & H. J. Miller), Springfield, Ohio.

We claim, first, The combination of the tubes, H, and plungers, B', operated by the oscillating arm, m, substantially as shown and described.

Second, The division box, D, with the adjustable mouthpiece, e, as set forth.

Third, The combination and arrangement of the endless bolts, L, with the tubes, H, for receiving and conveying the strip of clay, as set forth.

Fourth, The combination of the mold box, E, and followers, F, when connected by means of the bolts, b, and springs, d, and otherwise arranged to operate as shown and described.

Fifth, We claim the use of the set screws, O, or their equivalents when arranged substantially as described for the purpose of adjusting or regulating the pressure on the brick, as set forth.

Sixth, We claim providing the molds with the groove x, and oil cup, e', as set forth.

Seventh, The sliding frame, h, arranged to operate as described, for the purpose of delivering the brick from the machine, as set forth.

Eighth, We claim the combination of the cam wheel, K, lever, l, and the plunger stems, a a' and d, for the purpose of giving to the mold, E, and the follower, F, the movements herein described.

Ninth, We claim a brick presser or follower having cloth secured to its face by means of the band, y, fitting in a recess formed therein, as shown and described.

56,848.—WATER WHEEL.—J. D. Chase, Denison Chase, and Jefferson Chase (assignors to themselves and Daniel Pomeroy), Orange, Mass.

We claim, first, The construction of the buckets, H H, as arranged in relation to the central hub and inclosing cylinder, substantially as and for the purpose herein specified.

Second, We also claim the extension of the upper edges of the buckets, H H, upward within the conical part, a, of the curb, A, in combination therewith, substantially as and for the purpose set forth.

Third, We also claim the combined arrangement of the bridge tree, I, adjustable as described in the claims, M M, and the inclosing curb cylinder, G, and the wheel therein, substantially as and for the purpose herein specified.

56,849.—ROD COUPLING.—David Daltry (assignor to himself and John Parker), Philadelphia, Pa. Antedated July 13, 1866.

I claim the combination of the tapering enlargements a a', of the two tubes, the clamp pieces, C and C', and the sleeve, D, the whole being constructed substantially as and for the purpose specified.

56,850.—ROTARY PUMP.—Rollin Defrees (assignor to self and John D. Defrees), Washington, D. C.

I claim, first, The induction and eduction ports through the rotating cylinder which carries the sliding vane by means of which the water enters and departs from the pump chamber, in a direct vertical line through said rotating cylinder, substantially as described.

Second, Forming the top and bottom of the pump chamber by means of the plates or disks, o o and m m, recessed for packing as described.

Third, Opening and closing the ports by means of the sliding vane, substantially as described.

Fourth, The water passages, l l, through the vane, whereby the pressure of the column of water in the well tube is admitted behind the vane to equalize the pressure of the water on the inner and outer sides of said vane, and obviate resistance to the action of the spring.

56,851.—HORSE HAY FORK.—James B. Drake (assignor to Drake, Sill & Hutson), Picture Rocks, Pa.

I claim, first, The combination with the adjustable parallel bars, A A', of the stationary cutter, B, and pivoted cutter, B', all arranged to operate substantially as described.

Second, The adjustable cutter, B', formed with a circular cutting edge, b, and lifting points, 2, substantially as described.

Third, In combination with the above, I claim the bar, C, pivoted to the bars, A A', and provided with studs to enable the said bar, C, to be operated by a cord or otherwise.

Fourth, In a hay fork and knife constructed as herein described, I claim the latch, F, and stop, G, or their equivalent, for the purpose set forth.

56,852.—APPARATUS FOR DISTILLING PETROLEUM.—M. P. Eratus (assignor through mesne assignments to H. B. Everett and P. Ewing), Rochester, N. Y.

I claim, first, The combination of a continuous feed with a vacuum still for petroleum, operating substantially as and for the purpose herein set forth.

Second, The combination of a jet condenser with a vacuum still for petroleum, operating substantially in the manner and for the purpose herein specified.

Third, The combination of the two or more condensers, H H, with each other and a vacuum still, A, in such a manner that the action may be alternated from one to another to preserve the vacuum, and to allow the constant running of the still, as set forth.

Fourth, The arrangement as a whole, consisting of the retort, A, condensers, H H, connected by the tubes, G G, and pipes, I I, operating substantially as and for the purpose specified.

56,853.—SLEEPING CAR.—Ben Field, Albion, N. Y. assignor to himself and Geo. Pullman, Chicago, Ill.

First, In combination with the couches of a convertible sleeping car, I claim the hinged board, B, when attached to the back

of a seat, and capable of being adjusted substantially in the manner and for the purpose set forth.

Second, In combination with the upper couch, C, I claim one or more intermediate pieces, G, connecting the head and foot pieces, F F', and the partitions, E, substantially in the manner and for the purposes set forth.

56,854.—FASTENING PAPER COLLARS.—S. Hodgins (assignor to himself and Stephen Blackie), St. Louis, Mo.

I claim in elastic strip provided with one or more button holes, and one or more hooks when arranged in relation to a paper collar, substantially as described.

56,855.—LIFE BOAT.—William Hughes (assignor to himself and John Fieldstad), Waupun, Wis.

I claim a boat having the two chambers, A and B, on each side, the former being a water chamber open at bottom, a, and at top, a', as also the latter being an air chamber open at bottom, a'', the two having a partition, C, between them, arranged, constructed and cooperating in the manner described, and for the purpose set forth.

56,856.—COVERING FOR STEAM PIPES AND BOILERS.—E. C. Little (assignor to Eveline Little), St. Louis, Mo.

I claim covering steam pipes and boilers with a coating of plaster of Paris cement, with or without a rapping of canvas, for the purpose of retaining the heat and preventing its loss by radiation in the manner herein described.

56,857.—FISHING LINE SINKER.—John R. Martin, Boothbay, Me., assignor to Samuel K. Hilton, Portland, Me.

I claim the movable staple, bolt, or slide, inserted in the top of the sinker beneath the plate with a mouth or space for the admission of a swivel or line which is opened or closed at pleasure as described above, by means of which the sinker is readily detached from the line.

Also the connection of a plate of hard metal with a body of soft metal, each of which is made separate as well as the movable staple, and either of which may be supplied anew at pleasure.

56,858.—APPARATUS FOR BUOYING VESSELS.—Thomas Cato McKeen, Irvington, N. J.

I claim the use and application of the air reservoir or receiver, A, in combination with the bags or buoys, F, whether connected together directly by the use of pipes, or by the use of intermediate main, C, and the method of constructing the air receiver the buoys and netting, and of inflating the buoys by means of compressed air; the application to and use with the buoys of the common self-acting safety valve, made to yield or discharge at a certain pressure; and the application and use of the hole and its head to and with the buoys, the whole arranged and operating substantially in the manner and for the purposes above set forth.

56,859.—BROOM HEAD.—Wm. A. Middleton (assignor to himself, David J. Brounger and G. H. Hammer), Harrisburg, Pa.

I claim, first, The skeleton, B, in combination with the clips, C, and handle, A, when said parts are arranged as set forth.

Second, In combination with the metallic frame, I claim the application of cement, substantially as set forth, for the purpose of securing the brush in place.

56,860.—BLEACHING PALM, STRAW, ETC.—Franklin Perrin, Cambridge, Mass. assignor to himself and D. C. Perrin, Boston, Mass.

I claim the improvement in bleaching palm leaf, cane, straw and similar fibrous bodies, substantially as described.

56,861.—COFFEE ROASTER.—Paschal Plant (assignor to himself and Peter Hannay), Washington, D. C.

I claim the cylinder, A and B, either singly or combined, when used in combination with wire gauze or perforated plate, E E, and openings, a a, arranged in the manner substantially as and for the purpose set forth.

56,862.—MACHINE FOR SMOOTHING IVORY KEY BOARD.—Milon Pratt (assignor to himself and Clemens Darnstaedt), Meriden, Conn.

I claim the combination of the reciprocating bed, B, adapted for the securing upon it of ivory key pieces, rotary head, C, provided with cutters, a a, arranged obliquely in pairs, and the guide ways, A, all constructed, arranged, and employed as specified, for smoothing off the ivory surface of key board.

56,863.—PROCESS FOR PURIFYING AND DEODORIZING WHISKY.—E. F. Prentiss and R. A. Robertson, Philadelphia, Pa. (the latter assigns his right to W. D. Philbrick and W. J. Parsons.)

We claim the process of purifying and deodorizing alcoholic liquids by passing them, while in a vaporous state, through the interstices of a porous, perforated, cellular, granulated, or otherwise finely divided neutral material, kept wet with a solution of alkali, or of alkaline salts, or of the substances having an equivalent purifying action, in the manner and for the purposes substantially as described.

56,864.—APPARATUS FOR PURIFYING AND DEODORIZING WHISKY.—E. F. Prentiss and R. A. Robertson, Philadelphia, Pa. (the latter assigns his right to W. D. Philbrick and W. J. Parsons.)

We claim the trap tubes, E, or their equivalents, in combination with the neutral material, K, contained in one or more drawers or cases, in the manner and for the purpose substantially as shown and described, the whole being used in connection with a still, for the purposes herein set forth.

56,865.—CLOTHES WRINGER.—Hiram Robbins (assignor to himself and Thomas H. Foulds), Cincinnati, Ohio.

I claim, first, The reversible, scolloped, and counter-sunk spring, O P P' Q', in the described combination with the perforated and slotted posts, A B, beam, D, relaxing screw, E, upper roll, J, and rods, M M'.

Second, I claim, in combination with the above, the spring, N, interposed between the two pressure rods, M and M'.

Third, I claim the combination of the spring washer or cushion, S, the beam, D, and the head of the screw, E.

56,866.—CAR COUPLING.—W. E. Tickler, E. T. Marshall, and Daniel M. Marshall, Pierceton, Ind.

We claim the rising and falling pin, D, connected with a sliding frame composed of the rods, B B, and car, C, in combination with bar, D\* and F, the former being provided with a weight, G, and both connected with a shaft, E, the sliding bar, J, connected with a pendulum frame, I, on shaft, E, and the plate, K, all arranged to operate substantially in the manner and for the purpose set forth.

56,867.—FIRE KINDLING.—William F. Wenisch, New York City, assignor to himself and John Wenisch, Newtown, N. Y.

I claim a composition for kindling wood or coal fires, formed by combining rosin, dry saw dust, and dry sand with each other in the proportions and in the manner substantially as herein described and for the purpose set forth.

56,868.—MACHINE FOR DRYING AND CLEANSING GRAIN, ETC.—August Tonnar, Prussia, Germany, assignor to Sigismund, Drey & Moritz, Rosenheim, New York City.

I claim, first, The conical perforated agitators, J, constructed substantially as specified, in combination with the centrifugal disks, K, and hot air pipe, L, for the purposes, and as specified.

Second, I claim the arrangement of the chute, S, and valve, h

in combination with the chute, D, and conical agitators, for the purpose, and as set forth.

#### 56,869.—MACHINERY FOR SWAGING THE HEADS OF SCREW AUGERS.—Russell Jennings, Deep River, Conn.

I claim, First, The operating of the heading die, by the rotating shaft, B, through the medium of the loose driving wheel, E, provided with the pins, G, the sliding wheel, F, placed on a square shaft, B, and provided with projection, I, beveled at one end, in connection with the sliding rod, H, and the fixed inclined lip, A, all arranged to operate, substantially as set forth.

Second, The forming die, consisting of the portions, 11' D, constructed and operating substantially as described.

Third, The combination of the heading die, D, mold or female die, L, toggle, M, and driving or operating mechanism so arranged that the driving shaft, B, may at the will of the operator be connected with and disconnected from the continually rotating driving wheel, E, substantially as described.

#### 56,870.—DISINFECTING COMMODE.—H. J. Alvord, Detroit, Mich.

I claim the arrangement and combination of the pans, D and E, perforated annular flange, C, and cover, F, with the bucket or casing, A, or their equivalents, substantially as and for the purposes described.

#### REISSUES.

#### 2,323.—CLOTH GUIDE FOR SEWING MACHINE.—George F. Clemons, Springfield, Mass. Patented June 27, 1865.

First, I claim in a sewing machine a cloth guide adapted to give adjustably variable pressure upon the material being sewed, for the purpose specified.

Second, In combination with a cloth gage upon a sewing machine, I claim a spring pressure plate presenting a smooth bearing surface upon the material being sewed, and having means for an adjustment of the pressure for guiding the same toward the gage face, and for distribution of its pressure upon the material, substantially as and for the purposes set forth.

Third, Regulating the pressure of the guide plate by means of the auxiliary plate, H, arranged and operating substantially as and for the purposes specified.

Fourth, The combination of the spring plate, E, and pressure plate, H, with the cloth gage, C, in the manner and for the purposes shown and described.

Fifth, The combination of the spring plate, E, and pressure plate, H, with the gage plate, C', pivoted to the shank, G, substantially as and for the purposes set forth and shown.

Sixth, The combination of the pivoted gage plate, C', and gage shank, G, arranged and operating substantially as and for the purposes specified.

#### 2,324.—MACHINE FOR MAKING NUTS.—George Dunham, Unionville, Conn. Patented June 27, 1865.

First, I claim constructing and arranging the sizing bar, O, so as to act in the three-fold capacity of sizing, holding, or gaging, actuated by proper mechanism, substantially as and for the purpose described.

Second, I claim the combination of the conical-shaped recess, Q, with the spring or yielding table, P, substantially as and for the purpose described.

Third, I claim the combination of the shearing punch, L', with the conical recess, Q, substantially as and for the purpose described.

Fourth, I claim the employment of the lifting holder, S, S', substantially in the manner and for the purpose described.

Fifth, I claim the employment of the hammers, K1 and K2, or their equivalents, in combination with the holders, S S, substantially as and for the purpose described.

Sixth, I claim the clearer bar, N, for holding, clearing, and carrying the nut from one point to another, substantially as described.

Seventh, I claim the screw upon the upper end of the punch, K, in combination with the threaded socket, I, substantially as described.

Eighth, I claim a machine constructed substantially as described for cutting the blank forming the basis, and hammering or finishing the edges of a nut before the punching of the hole, substantially as described.

#### 2,325.—HOISTING APPARATUS.—John Semman, Cincinnati, Ohio. Patented July 17, 1866.

I claim the arrangement of the pulleys, K V R, belt, L, rectangular frame, B C D, pulley, M, shaft, N, and operating in the manner and for the purpose herein specified.

Second, I claim the system of gearing, composed of gear wheels, G G, worm wheels, H H, worms, I I, and racks, F F, all arranged and operating substantially as and for the purpose described.

Third, I claim in hoisting machines the use of two worms on one shaft, the one right hand and the other left, each gearing into an appropriate worm wheel, and each furnishing a step for the other, substantially as shown and described.

Fourth, I claim in power hoisting machine the attaching to and carrying the climbing machinery with the platform, the power for operating the same not being located on the platform, in the manner herein described.

#### 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.

#### ON HAND, FOR SALE LOW—

SCREW CUTTING ENGINE LATHES, 16 FEET long, 24-inch swing; 13 ft. by 20-in.; 6 ft. by 15-in.; IRON PLANERS: 5-ft. by 24-in.; Hand Lathes; Scroll Chucks; Horton's GEARED SCREW CHUCKS; UPRIGHT DRILLS, with and without back gears; TWIST DRILLS, Drill Chucks and Sockets; Bolt Cutters; Pay's Patent FORGE HAMMER; PORTABLE ENGINE (10-horse); all new and first-class. Also, Leather and Rubber Belting, and Superior Oils. The

#### BEST COTTON GINS, COTTON AND WOOL MACHINERY AND SUPPLIES, and MACHINISTS' TOOLS of all sizes furnished promptly at Manufacturer's Prices. Address

W. CHASE & GEHRMANN, 6 S. Howard-st., Baltimore.

#### 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, 2 Jacob street, near Ferry street, New York.

#### BRIDGE BUILDERS—Send your address to ALEX. Y. LEE, Civil and Hydraulic Engineer, Society Hill, So. Ca.

#### 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 24, 1866, and close Oct. 30th.

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, Chairman Exhibition Committee.

#### A GOOD NUMBER.—

The Phenological Journal for August contains Portraits of Ben. Franklin, Lewis Cass, C. F. Brydges, Brunell, Mrs. Parkhurst, etc., with articles on Responsibility; Sowing and Reaping; The Servant Question; Getting Married; Writing, the Philosophy of Phonography; How to Live; Air and Sunlight; Summer, and its Lessons; Over-Eating; Head and Body; Man-Monkeys; Insanity, and Religious Excitements; Physiognomy, Time, Tune, Veneration, Double Chins, Large Ears, etc. 20 cents, or \$2 a-year. FOWLER & WELLS, N. Y.

#### 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.

#### BAILEY'S NEW PATENT CHURN.

THOMAS H. BAILEY, Of Lockport, has taken out a Patent for a Churn, for which he claims superiority over any thing yet offered as a substitute for the old-fashioned hand-working inferior plan. He claims that his Churn is just what has long been sought for.

A LABOR-SAVING CHURN: While more Butter is produced than by any plan yet offered. He offers Town, County, and State Rights for sale, or Licenses to Manufacturers. For particulars address BAILEY & STARKS, Lockport, N. Y.

#### NATIONAL INVENTORS' EXCHANGE,

333 F STREET, WASHINGTON, D. C. This institution is organized to facilitate the introduction of Patented Inventions throughout the United States. Its branches are rapidly extending into every State, and afford the best facilities for Inventors and Manufacturers to dispose of their rights and goods in the cheapest and most expeditious manner. Circulars furnished. [1\*] WM. A. WHITE & CO., Managers.

#### CLOCKS FOR TOWERS, OFFICES, ETC.,

also Glass Dials for Illuminating. Address JOHN SHERRY, Oakland Works, Sag Harbor, N. Y.

#### LEAD AND BLOCK-TIN PIPE AND SHEET-LEAD WORKS,

BAILEY, FARRELL & CO., Manufacturers and Dealers in Lead and Block-Tin Pipe, Sheet Lead, Bar and Pig Lead, Hydrant Hose, Oil Globes, Globe Valves, Steam Gages and Whistles, Sinks, Bath Tubs, Brass and Iron Lift and Force Pumps, and all kinds of

WATER, GAS, and STEAM GOODS used by Plumbers, Machinists, Railroads, etc. \*Send for a circular. 1\*

#### BOILERS, ALL KINDS, FOR SALE AT

Franklin Boiler Works, foot of Morgan-st., Jersey City. Have on hand, nearly completed, 6, 8, 10, 15, 18, 40 and 70-horse Boilers. Drawings executed to order. 1\*

#### 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. 75\*

#### DRAWING AND SURVEYING INSTRUMENTS

in every variety. Descriptive priced Catalogue forwarded on application. T. H. McALLISTER, Optician, of the late firm of McAllister & Bro., Philadelphia, 49 Nassau st., N. Y. [1\*

#### WINANS'S ANTI-INCRUSTATION POW-

DER, New York: Eleven years in efficient, satisfactory, and unobjectionable use, in over six thousand instances. 74\*

#### FOR SALE.—

A valuable mill and machine property at Branchville, Sussex county, New Jersey, within seven miles of railroad direct to New York, with almost a certainty of an extension of railroad to Branchville within one year. Said property consists of 8 acres of land, with excellent water power, new flouring mill, saw mill, cider manufactory, shops and machinery, barn, dwelling house, etc. Call upon or address ALEXANDER HOUGH, At Branchville, Sussex county, N. J. 1\*

#### 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, Nos. 23 and 25 Potter street, Hartford, Ct. 5 tf]

#### COTTON MACHINERY FOR SALE BY THE

HARRISBURG COTTON MILL COMPANY, Harrisburg, Pa.

Two (2) 30-inch Pickers, one Beater each, strong Machine Iron frame, in good working order.  
One (1) 30-inch Picker, two Beaters, New—rebuilt.  
Four (4) 30-inch Pickers, two Beaters each.  
One (1) Willey, or Cotton Opener, New, with Trunk.  
One (1) Willey, or Cotton Opener.  
Six (6) Railway Heads, four Rolls each.  
Eight (8) Drawing Frames with Collars, four Deliverers each, with spare Rolls, Stands, etc.  
One (1) Cloth Folding and Measuring Machine, in good order.  
One (1) Reel—45 Spindles—New and Good.  
One (1) Taunton Speeder.  
One (1) Baling Machine for Yarn or Carpet Chain. 34\*

#### ORDERS FOR BELT STRETCHERS—

Capable of taking in a 12-inch Belt—filled on Sight of Order. Other Sizes put up on Short Notice. WILL SELL THE ENTIRE RIGHT LOW. Send for Circular. [34] SEYMOUR ROGERS, Pittsburgh, Pa.

#### CAMDEN TUBE WORKS (OFFICE AND

Manufacture Second and Stevens streets, Camden, N. J.) Manufacturers of Wrought Iron Welded Tube of all sizes; Peace's Improved Gas Pipe Screwing Machines for both Hand and Power; Pipe Vises, Stocks, Dies, Taps, Reamers, Tongs, and all other tools used by Steam and Gas Fitters. Also, Upright Drill Presses for both Hand and Power, constantly on hand, and ready for delivery. 24\*

#### 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 cow\* E. D. & G. DRAPER, Hopedale, Mass.

#### 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

#### WINTER'S IMPROVED CIRCULAR SAW-

MILL, and appurtenances, with Lane's Patent Set and Feed Works.

The Brooklyn Saw-Mill Company write, May 5, 1866: "We have in use Winter's Mill, with Lane's Patent and Emerson's Independent Tooth Saw, and regard them superior to any other in use, and among the greatest improvements of the age." Pamphlets furnished.

WINTER & CO., No. 40 Broadway, New York. 44

#### T. N. HICKCOX,

Manufacturer of STAMPED AND PRESSED BRASS GOODS, Lamp and Lantern Trimmings, Plain and Fancy Brass Caps for Pomatum and Mucilage Bottles, Baggage and Key Checks, etc. Labels for Oil Cans, Stoves, House Furnishing Goods, Insurance Companies, etc. Steel Dies of any Design Required. Manufactured on the premises, by experienced workmen, under the most careful supervision; Presses and Light Machinery manufactured to order. Brass Goods Dipped, Lacquered, Silver-Plated, etc. 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, cor. John and Pearl-st., Brooklyn. 44\*

#### MASON'S PATENT FRICTION CLUTCHES,

for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by VOLNEY W. MASON, Providence, R. I. 6 tf

#### FOUNDRY AND MACHINE SHOP FOR

SALE. In Good Running Order, with good, durable water power. For particulars, address Post-office box 246, Jamestown, New York. 26\*

#### IMPORTANT TO MANUFACTURERS AND

Inventors.—SMITH & GARVIN, No. 3 Hugué 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. 628\*

#### COPPER VACUUM PANS FOR SALE.—

One of 6-feet diameter, and one of 52-in., with air pump complete. Apply to GRAVES & PIER, 276 Water street, New York. 54\*]

#### 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. 57\*

#### WROUGHT IRON TACKLE BLOCKS—

all sizes. Also, Doyle's Patent Hoisting Machines, on hand, for sale by LEACH BROTHERS, 102 Liberty street, New York. 5 13]

#### 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., 31 Exchange street, Boston, Mass. 5 12]

#### STATE RIGHTS OF A VALUABLE PATENT

For Sale. Apply to S. HARTSHORN, No. 63 Center street. 1\*

#### A MESSEURS LES INVENTEURS—AVIS

Important. Les inventeurs non familiers avec la langue anglaise, et qui préféreraient nous communiquer leurs inventions en Français peuvent nous adresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront regues en confiance. MUNN & CO., Scientific American Office, No. 37 Park Row, New York.

#### 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., 532] Utica, N. Y. Branch office, 96 Maiden Lane, N. Y. City.

#### SCHOOL OF MINES, COLUMBIA COLLEGE,

EAST 49TH STREET, NEW YORK.

Faculty: F. A. P. BARNARD, S.T.D., LL.D., President. T. EGGLESTON, 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

DR. C. F. CHANDLER, Dean of the Faculty. 58\*]

#### W. H. BULLOCH, PATENT OFFICE MOD-

el Maker, No. 147 East Madison street (Between Clark and LaSalle streets), Chicago, Ill. 52\*

#### THE NONPAREL 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. 5 tf]

#### EMPLOYMENT—"PLEASANT AND PROF-

ITABLE." Agents wanted to sell New Physiognomy—1000 engravings, price \$5,—and other illustrated standard works. Send stamp for terms, to FOWLER & WELLS, New York. 54]

#### DRILL CHUCKS, OLMSTED'S PATENT,

will be forwarded to any address on receipt of price. Price:—No. 1, opens 3-in., \$7. No. 2, opens 3-1/2, \$5 50. Illustrated in the Scientific American of July 7th. The trade generally are supplied. L. H. OLMSTED, 2] Stamford, Conn.

#### TO OLD AND YOUNG.—

For 30 cents and stamped addressed envelope, I send materials for 25 beautiful Magic Photographs. With a few drops of water a child can make them. Address

THEODORE E. KING, Landscape Photographer, Cambridge, Mass. 52]

#### FIRST-CLASS TOOLS.—

36-in. and 25-in. Lathes, 32-in. and 24-in. Planers, Radial and Upright Drills, and 10-in. Shapers, finished. 30-in. Lathes, Boring and Chucking Lathes, 18-in. Shapers, and Horizontal Drills making. E. & A. BETTS, 53] Wilmington, Del.

#### IMPORTANT TO BLACKSMITHS.—The most

Economical and valuable Bolt-Heading Machine in the world, at a price within the reach of every blacksmith—only \$120. A Wonderful Labor and Time-Saver. Send for Circular to L. E. OSBORN, Sec'y "Davis Bolt-Heading Machine Co.," 45\*] New Haven, Conn.

## 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 tons 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**, No. 72 Sudbury street, Boston, Mass. 1 tf

## TOWER'S

**ALCOHOL PROCESS OF TANNING.** Patented Dec., 1865; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months.

It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better. Every one knows the preservative effect of alcohol upon all animal matter. It is applicable either to limed or sweated skins or hides. From sweated skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market.

No complicated or expensive machinery is needed. Any tannery may be adapted to the use of this process, for less than one hundred dollars.

Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston 21 13\*

L. FREDERICK RICE, Agent.

**\$150 A-MONTH! NEW BUSINESS FOR AGENTS.** [7 1\*] H. B. SHAW, Alfred, Me.

## 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. ROADLEY & 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 &amp; 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. 41y

Who are the only manufacturers of J. A. Fay & Co.'s Patent Wood-working Machinery in the United States. 41y

## R. BALL &amp; CO.,

SCHOOL STREET, WORCESTER, MASS.,  
Manufacturers of Woodworth's, Daniel'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\*

## LENOIR PATENT GAS ENGINES,—WITH-

out 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.

## GROVER &amp; BAKER'S HIGHEST PREMIUM

ELASTIC Stitch Sewing Machines, 405 Broadway, N. Y. 1 tf

## WOODWORTH PLANERS, BARLETT'S

Patent Power Mortise Machine, the best in market. Wood-working 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**, Coxsackie, N. Y. 1 tf

**\$1500 PER YEAR**, paid by **SHAW & Clark**, Biddeford, Me., or Chicago, Ill. 1\*

## ATMOSPHERIC TRIP HAMMERS.

Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by **CHARLES MERRILL & SONS**, No. 556 Grand street, New York. They are very simple in construction, require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or swaging they are unequalled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x56 inches floor room. Send for circular giving full particulars. 1tf

## 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 tons weight, made in green sand, dry sand or loam, as desired. Also Fine 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\*

## IMPORTANT TO RAILROAD TRAVELERS.

THE PORTABLE RAILWAY HEAD-REST or POCKET-BERTH. Patented July 4th, 1865. SUBSTANTIAL, SIMPLE, COMPACT. By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railway Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made. Agents wanted in all the principal cities. Address **JOHN R. HOOLE**, Selling Agent, [1\*] No. 124 Nassau street, New York.

## ERICSSON CALORIC ENGINES OF GREAT-

LY 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 horsepower 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

## THE AMERICAN VISE—A WELL-CON-

structed 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\*

## INCORUSTATIONS 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\*

## AMERICAN EMERY.—GUARANTEED SU-

perior 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\*

## ROCKWOOD &amp; CO., PORTRAIT, LAND-

scape, and mechanical photographers, 839 Broadway, New York. This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 1

## 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 **QUASSACK MACHINE SHOP**, Newburgh, N. Y. 48\*

## 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

## "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 38\*

## MODELS, PATTERNS, EXPERIMENTAL

and other Machinery, Models for the Patent Office, built to order by **HOLSKE & KNEELAND**, Nos. 523, 530, and 532 Water street, near Jefferson. Refer to **SCIENTIFIC AMERICAN** Office. 1 tf

## 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

## 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\*

## FOR DANIELLS'S PLANING MACHINES,

Car Mortising, Boring Machines, Car Tenoning Machines, Car Planing and Beading Machines, etc., address **J. A. FAY & CO.**, Cincinnati, Ohio. 41y

## 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.

## 10,000 AGENTS WANTED, IN EVERY

TOWN, COUNTY, and STATE, to sell Toplift's Patent Perpetual Lamp Wick. Needs no Trimming. Sample sent for 20c; two for 30c. State and County Rights for Sale. **MURPHY & COLE**, 81 Newark Avenue, Jersey City, N. J. 3 tf 1

## 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\*

## TWIST DRILLS (ALL SIZES) FOR STUBBS'S

Wire and Machinists' use, on hand for sale by 26 13] **LEACH BROTHERS**, 102 Liberty street, New York.

## VAN DE WATER CELEBRATED WATER

Wheel for sale at the Eagle Iron Works, Buffalo, N. Y. Send for Circulars. [26 8\*] **DUNBAR & HOWELL**.

## WE WILL CONTRACT

FOR THE MANUFACTURE OF ANY KIND OF MACHINERY requiring good workmanship. Punching Presses, Dies, and tools of all kinds. Have unusual facilities for doing this class of work promptly. **MOSES G. WILDER & CO.**, West Meriden, Conn. 1\*

## CAUTION.—THE PUBLIC ARE HEREBY

Informed that the Patent of Hewitt & Haly, bearing date May 8th, 1866, is subordinate to the Patent covering "Ashcroft's Low Water Detector, all infringements will be prosecuted to the extent of the law." **JOHN ASHCROFT**, 50 John street, New York. 4 4\*

## OLMSTEAD'S PATENT FRICTION CLUTCH

PULLEY is adapted to any machine that runs with a belt, and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line. Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently or to speed up instantly.

Parties wanting these Pulleys are invited to correspond with **WM. M. BETTS**, Sole Proprietor, Stamford Machine and Tool Works, Stamford, Conn. 19 13\*

## THE BEST FORGING 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. 4 tf

## TO RAILROAD AND TELEGRAPH COM-

PANIES.—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.

## BROUGHTON'S OILERS.—THE DOUBLE

Bottom, The Seamless, The Engineers', The Double-acting, and the Transparent Top. Sold at first-class Hardware stores. 4 13] **BROUGHTON & MOORE**, Manufacturers, New York.

## BULLARD &amp; 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 50 per cent of oil. By making a specialty of shafting, we are able to furnish very superior work at reasonable rates. Heavy work built to order. 2 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.

## 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 1/2 to 6 tons. PORTABLE ENGINES, 2 to 30 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]

## 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. 21 52\*

**WILLIAM V. McALLISTER**, 723 Chestnut street, Philadelphia.

## GODDARD'S BURNING MACHINE WORKS,

Office, No. 3 Bowling Green, New York, manufacture the Patent Steel Ring and Solid Packing BURNING MACHINES, Patent Mestizo Wool-burning Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc. Orders respectfully solicited, and prompt attention given, by addressing **C. L. GODDARD**, No. 3 Bowling Green, N. Y. 26 tf

## ENGINEERING SCHOOL, FRANKLIN, N. Y.,

has full equipment, and offers thorough instruction. Special advantage—the small cost of living. For Circulars address 21 12\* **G. W. JONES**, A. M.

## WHEELER &amp; WILSON, 625 BROADWAY,

N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1tf

## AMERICAN PEAT COMPANY.—THIS COM-

pany, 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, 42 1/2 Kilby st., Boston.

## M. BAILEY &amp; CO.,

PROVISION BROKERS, No. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 1 5\*

## STEAM ENGINES WITH LINK MOTION,

Variable Automatic Cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, etc. Address 7 26\*] **M. & T. SAULT**, New Haven, Conn.

## 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

## 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. 20 26\*

**LAMB, COOK & CO.**, Proprietors, Slatersville, Ill. R. 1.

## REYNOLDS'S TURBINE WATER WHEELS!

**REYNOLDS'S PATENT SWEEPS THE FIELD!** New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Works; Compact for Shipment; Great Water Saver.

THE ONLY WHEEL THAT EXCELS OVERSHOTS! Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. **GEORGE TALCOTT**, Late **TALCOTT & UNDERHILL**, No. 96 Liberty street, N. Y. 21 13\*]

## TO WRENCH MAKERS.—FOR SALE UPON

Reasonable Terms, a valuable patent on a Pipe-Wrench Address, [26 11\*] **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 1/2 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. 8 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**, P. O. Box 1,037, Boston, Mass. 36 15\*]

## LITTLEFIELD'S PATENT SCAFFOLDING.

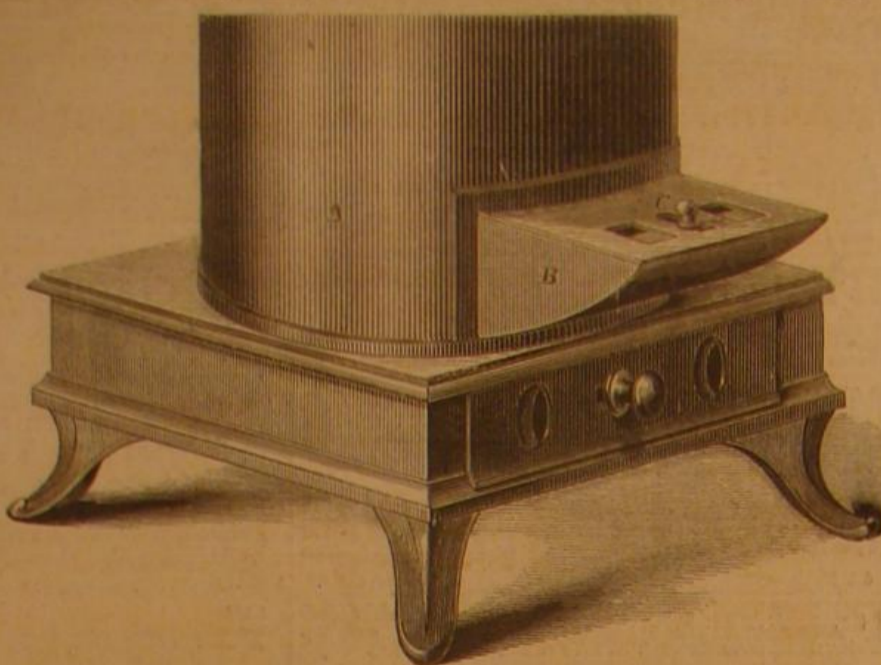
One of the simplest and best contrivances for Builders and Painters that has ever been invented, is the Scaffolding recently patented by the subscriber.

The utility and simplicity of this scaffolding, and the safety and ease with which it is adjusted, recommends it to all who have occasion to use the article. State, County, or Single Rights for sale low. Address **HORACE LITTLEFIELD**, 4 8\*] Lewis Cass county, Iowa.

**Improved Stove Attachment.**

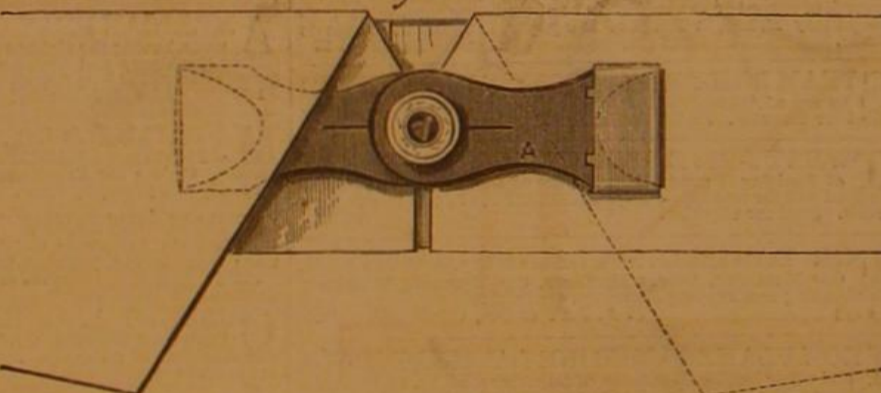
This engraving illustrates an invention designed to save fuel and do away with the inconvenience of emptying stoves to rekindle a fire in them.

In the engraving, A represents a stove, and B the attachment. It consists of an iron box, C, in which the kindling wood is placed so that it lies against the fuel, and the flame from it will play against the same and ignite it, and thus obviate the trouble alluded to. It is well known that large quantities of fuel are annually wasted in the form of cinders which might be turned to account if people were not too lazy to sift the ashes. The invention is designed to obviate even this trouble, for, by thoroughly raking the principal grate, so that all the ashes are thrown out, what remains will ignite readily, the clinker in good coal being but a small part of the whole. A patent is now pending on this invention through the Scientific American Patent Agency, by J. W. Elliott. For further information address him at Toronto, C. W., Box 556.

**ELLIOTT'S STOVE ATTACHMENT.**

which serves as a symbol of music. The ornamental pipes in front are not, as is usual, gilt, but silvered. They are made of block tin, and contrast effectively with the wood-work of the case, which is of black walnut. At the ends of the pediment, at the top of the case are a cluster of silvered trumpets, nine in number, at each side, diverging from a common center at an angle of about forty-five degrees. The extreme upper corners of the instrument are finished by massive urns.

The instrument has four manuals of fifty-eight keys each. The pedal has thirty-eight. These man-

*Fig. 1.**Fig. 2.**Fig. 3.***HODGINS'S COLLAR FASTENING.**

uals can be played together or separate, and the Messrs. Hook have applied pneumatic levers, connected with auxiliary bellows, to equalize and overcome the resistance, which is so wearisome to the player when the manuals are united. The movement for regulating the volume of sound without the aid of the stops is exceedingly simple and effectual. It is done by the feet of the performer, who can slide a movable carriage and increase or diminish the volume at pleasure. It makes an admirable crescendo attachment.

There are four bellows, with a capacity of 500 cubic feet. They are worked by hydraulic engines of six inches bore with twelve inches stroke. They are fed by water pipes from the street mains, and work automatically, the supply of water being governed by the state of the bellows, with which the valves are directly connected, so that if one bellows is nearly exhausted, the engine connected with that works rapidly until it is filled, when it diminishes in

**THE GREAT ORGAN AT PLYMOUTH CHURCH.**

For eighteen months past the establishment of E. & G. G. Hook, of Boston, has been engaged in building an immense organ for the church of Rev. Henry Ward Beecher, in Brooklyn, and on the evening of the 27th ult. it was first exhibited to a few invited guests. It is the largest organ ever built in this country, containing 3,442 pipes and costing \$25,000.

It occupies, with its attendant machinery for filling the bellows, a portion of the building extending from the floor of the sub-basement to the ceiling of the auditorium, which had to be raised to accommo-

date the instrument. From the gallery floor it occupies a space of 28 feet 5 inches wide by 22 feet 4 inches deep, and a height of 31 feet 7 inches. The external appearance is imposing. The style of the architecture is what is known as the Romanesque. Four handsome columns support a pediment, the apex of which is broken to receive the image of an angel,

speed. A hand wheel, connected with the water gate, is at the side of the organist, with bellows gages and a water gage, so that the starting and stopping of the engines, the pressure of water, and the state of the bellows, are at all times under the control and observation of the player. This is a new feature as applied to organs in this country, and a patent is now pending for the improvement through the Scientific American Patent Agency.

The power of the instrument, as exhibited at the time mentioned, was wonderful. The crash of sound when the full organ is used, and especially the "Tuba Mirabilis," referred to as the exposed trumpets, is absolutely startling. At the same time the tones of some of the stops, as the "Doppel Flote," the "Flute Harmonique," the "Vox Angelica," and the "Vox Humana," are indescribably soft, soothing, and pleasing. It is a magnificent instrument, and will be an additional attraction to this popular place of worship and a monument of American taste and ingenuity.

**Primitive Beehive.**

The following mode of keeping bees has been practiced in India for a long period, and is said to be very successful:—

"As honey forms a favorite article of food among the Himalaya highlanders, they have a very extensive sale for it; it is therefore with them a great article of internal commerce, in fact, the staple of their bazaars, where it always finds a ready vent. They obtain the honey without destroying the bees, by means of a hollow cylinder of wood inclosed in the wall of their huts, on the side most sheltered from the weather, and in which there is an opening without for the bees to enter. In the center of this hive there is a movable division which is kept open while the bees are making their honey; but as soon as the combs are full, the busy family is driven out by a noise made through the inward extremity. As soon as they have retreated, the central partition is closed and the combs are drawn out of the cylinder from the opening on the inner wall. The honey being secured, the hive is again opened and the bees commence their interminable labors of reproduction."

In ascending into the air, the heart-beats increase 5 for the first 3,000 feet, 7 more for the next 1,500 feet, 8 for the next 1,500, and 5 for each 1,500 feet of ascent after that. This is an average increase of one beat for each 100 yards of ascent.

**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.