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The Celebrated Niagara Suspension Bridge.

For many years it was a question discussed by the merchants and the people on each side of the line which divides the United States from the British possessions, how to make a permanent and safe connection between the opposite shores of the Niagara river. At length, in 1855, the problem was solved by the erection of the suspension bridge, which is to this day unsurpassed by any other similar structure in this or any other country.

THE SUSPENSION BRIDGE ACROSS THE NIAGARA.

The bridge is located about two miles below the falls, and spans the river at a hight of nearly 250 feet above the water. It is supported by four wire cables, nine-and-a-quarter inches diameter, which pass over towers erected on each side of the river. From center to center these towers are 800 feet apart. 14,560 wires were used in the cables, their united strength being estimated at 12,000 tuns. It is a railway and ordinary passenger traffic bridge combined, the carriage and foot ways being twenty-eight feet below the railway track. Its rigity and strength may be conceived when it is stated that under the passage of heavy trains the deflection is less than four inches.

Mr. John A. Roebling was the engineer, who will superintend the erection of the proposed bridge which is to connect New York and Brooklyn.

TELEGRAPHIC METEOROMETERS.—Prof. Wheatstone has devised a new class of instruments for taking observations in stations which for any cause are not accessible for very long periods. The telegraphic thermometer, a type of this class, consists essentially of two parts; the first is the magnetic-motor, constructed on a plan similar to that used by the inventor in his alphobetical magnetic telegraph, and is so arranged that by turning a handle the lever at the other extremity of the line will describe by regular steps a complete circle. The second part consists of a metallic thermometer, in which the unequal expansion of two different metals is made to move a lever or pin around a graduated circle which marks the degrees of temperature. The two parts are in such proximity that the telegraphic lever in passing around the circle must, at some point, come in contact with the pin, which is moved by means of the expanding or contracting metals. This contact breaks one circuit and completes another, and thus transmits to the other extremity of the telegraphic line information of the partiticular degree of heat at that instant indicated by the thermometer. This thermometer is not self-recording, but responds with accuracy when ever questioned.

MONEY'S IMPROVEMENT IN UMBRELLAS.

The insertion of the ordinary wire spring commonly used on umbrellas and parasols necessitates a mortise in the handle, which by being cut nearly through the stock diminishes its strength and makes that portion comparatively weak at the point which should be the strongest.

The slide, in which are pivoted the inner ends of the ribs, as seen in the engraving, is similar to that in ordinary use. It is shown in both the views in section. On a projection on one side of it is pivoted a double lever cam with a thumb piece on each arm of the lever. When, as in the engraving, the lower end of the lever is pressed down the boss of the eccentric or cam impinges rigidly and firmly on the surface of the handle or stick and the umbrella can be held open. On the contrary, when the upper end is forced in toward the staff the pressure of the boss of the eccentric is released from the stick and the umbrella can be readily closed, the slide moving freely on the stick. This position is seen in the small section marked A.

The patent for this device, obtained through the Scientific American Patent Agency, Oct. 29, 1867, is owned by William Money and Edgar McCloud, either of whom may be addressed relative to the sale of rights, etc., at Paterson, N. J.

The First Steam Fire Ship.

Edward Thomason, of Birmingham, England, laid before the Admiralty, in 1796, a model of a vessel propelled by paddle wheels and a steam engine intended for use as a fire ship. The rudder was also to be operated by the engine, the powder and combustibles also to be fired by the same means, as soon as the driving shaft had accomplished a certain number of revolutions. No person was to accompany the vessel. The distance from the English blockading fleet to the French fleet in the harbor being known, also the course of the channel, the steam fire ship was to be adjusted and started. After the engine had made a given number of turns, the rudder would be moved and the vessel's direction changed according to the channel, and so on until the paddles having made the total number of revolutions required to carry the ship into the middle of the hostile fleet, then presto, click, the explosion was to take place and the unsuspecting enemy were to be set on fire or blown sky-high. But in those days the Admiralty did not believe in steam power and so the novel fire ship was never built.

ADDING to the width of a belt and of the faces of the pulleys, increases immensely its power of conveying force. A wide belt is always better than a narrow one strained to its utmost capacity.

THE AMERICAN TORPEDO BOAT OF 1776.

The historical records of our Revolutionary war contain notices of the attempt made in 1776 to destroy the British fleet then anchored in the harbor of New York, by means of a submarine apparatus. The following details of the construction of the torpedo vessel, its operations and final loss, are from the pen of the inventor himself, D. Bushnell, of Connecticut, and were communicated by him many years ago, to the American Philosophical Society, from whose records we transcribe them. This we believe was the first submarine boat ever constructed. Every part seems to have been well considered, and the whole exhibits a degree of ingenuity quite remarkable for those early days of invention.

The external shape of the submarine vessel bore some resemblance to two upper tortoise shells of equal size, joined together; the place of entrance into the vessel being represented by the opening made by the swell of the shells, at the head of the animal. The inside was capable of containing the operator, and air sufficient to support him thirty minutes without receiving fresh air. At the bottom, opposite to the entrance, was fixed a quantity of lead for ballast. At one edge, which was directly before the operator, who sat upright, was an oar for rowing forward or backward. At the other edge was a rudder for steering. An aperture, at the bottom, with its valve, was designed to admit water, for the purpose of descending; and two brass forcing-pumps served to eject the water within, when necessary for ascending. At the top there was likewise an oar, for ascending or descending, or continuing at any particular depth. A water gage, or barometer, determined the depth of descent, a compass directed the course, and a ventilator within supplied the vessel with fresh air, when on the surface.

The entrance into the vessel was elliptical, and so small as barely to admit a person. This entrance was surrounded with a broad elliptical iron band, the lower edge of which was let into the wood of which the body of the vessel was made, in such a manner as to give its utmost support to the body of the vessel against the pressure of the water. Above the upper edge of this iron band there was a brass crown, or cover, resembling a hat with its crown and brim, which shut watertight upon the iron band; the crown was hung to the iron band with hinges, so as to turn over sidewise, when opened. To make it perfectly secure when shut, it might be screwed down upon the band by the operator, or by a person without.

There were in the brass crown three round doors, one directly in front, and one on each side, large enough to put the hand through. When open, they admitted fresh air; their shutters were ground perfectly tight into their places with emery, hung with hinges, and secured in their places when shut. There were likewise several small glass windows in the crown, for looking through, and for admitting light in the day time, with covers to secure them. There were two air pipes in the crown. A ventilator within drew fresh air through one of the air pipes, and discharged it into the lower part of the vessel; the fresh air introduced by the ventilator expelled the impure light air through the other air pipe. Both air pipes were so constructed, that they shut themselves whenever the water rose near their tops, so that no water could enter through them, and opened themselves immediately after they rose above the water.

The vessel was chiefly ballasted with lead fixed to its bottom; when this was not sufficient, a quantity was placed within, more or less, according to the weight of the operator; its ballast made it so stiff, that there was no danger of oversetting. The vessel, with all its appendages, and the operator, was of sufficient weight to settle it very low in the water. About two hundred pounds of the lead, at the bottom for ballast, would be let down forty or fifty feet below the vessel; this enabled the operator to rise instantly to the surface of the water, in case of accident.

When the operator would descend, he placed his foot upon the top of a brass valve, depressing it, by which he opened a large aperture in the bottom of the vessel, through which the water entered at his pleasure; when he had admitted a sufficient quantity, he descended very gradually; if he admitted too much, he ejected as much as was necessary to obtain an equilibrium, by the two brass forcing pumps, which were placed at each hand. Whenever the vessel leaked, or he would ascend to the surface, he also made use of these forcing pumps. When the skillful operator had obtained an equilibrium, he could row upward, or downward, or continue at any particular depth, with an oar, placed near the top of the vessel, formed upon the principle of the screw, the axis of the oar entering the vessel; by turning the oar one way he raised the vessel, by turning it the other way he depressed it.

A glass tube, eighteen inches long, and one inch in diameter, standing upright, its upper end closed, and its lower end, which was open, screwed into a brass pipe, through which the external water had a passage into the glass tube, served as a water-gage or barometer. There was a piece of cork, with phosphorus on it, put into the water-gage. When the vessel descended the water rose in the water-gage, condensing the air within, and bearing the cork, with its phosphorus, on its surface. By the light of the phosphorus, the ascent of the water in the gage was rendered visible, and the depth of the vessel under water ascertained by a graduated line.

An oar, formed upon the principle of the screw, was fixed in the fore part of the vessel; its axis entered the vessel, and being turned one way, rowed the vessel forward, but being turned the other way, rowed it backward; it was made to be turned by the hand or foot.

A rudder, hung to the hinder part of the vessel, commanded it with the greatest ease. The rudder was made very elastic, and might be used for rowing forward. Its tiller was within the vessel, at the operator's right hand, fixed at a right angle, on an iron rod, which passed through the side of the vessel; the rod had a crank on its outside end, which commanded the rudder, by means of a rod extending from the end of the crank to a kind of tiller, fixed upon the left hand of the rudder. Raising and depressing the first-mentioned tiller turned the rudder as the case required.

A compass, marked with phosphorus, directed the course, both above and under the water; and a line and lead founded the depth when necessary.

The internal shape of the vessel, in every possible section of it, verged toward an ellipsis, as near as the design would allow, but every horizontal section, although elliptical, yet as near to a circle as could be admitted. The body of the vessel was made exceedingly strong; and to strengthen it as much as possible, a firm piece of wood was framed, parallel to the conjugate diameter, to prevent the sides from yielding to the great pressure of the incumbent water, in a deep immersion. This piece of wood was also a seat for the operator.

Every opening was well secured. The pumps had two sets of valves. The aperture at the bottom, for admitting water, was covered with a plate, perforated full of holes to receive the water, and prevent anything from choking the passage, or stopping the valve from shutting. The brass valve might likewise be forced into its place with a screw, if necessary. The air pipes had a kind of hollow sphere, fixed round the top of each, to secure the air pipe valves from injury; these hollow spheres were perforated full of holes, for the passage of the air through the pipes; within the air pipes were shutters to secure them, should any accident happen to the pipes, or the valves on their tops.

Wherever the external apparatus passed through the body of the vessel, the joints were round, and formed by brass pipes, which were driven into the wood of the vessel, the holes through the pipes were very exactly made, and the iron rods, which passed through them, were turned in a lathe to fit them; the joints were also kept full of oil, to prevent rust and leaking. Particular attention was given to bring every part necessary for performing the operations, both within and without the vessel, before the operator, and as conveniently as could be devised; so that everything might be found in the dark, except the water-gage and the compass, which were visible by the light of the phosphorus, and nothing required the operator to turn to the right hand, or to the left, to perform anything necessary.

THE MAGAZINE.

In the fore part of the brim of the crown of the submarine vessel was a socket, and an iron tube, passing through the socket; the tube stood upright, and could slide up and down in the socket, six inches; at the top of the tube was a wood screw, fixed by means of a rod, which passed through the tube, and screwed the wood screw fast upon the top of the tube; by pushing the wood screw up against the bottom of a ship, and turning it at the same time, it would enter the planks; driving would also answer the same purpose; when the wood screw was firmly fixed, it could be cast off by unscrewing the rod, which fastened it upon the top of the tube.

Behind the submarine vessel was a place above the rudder for carrying a large powder magazine; this was made of two pieces of oak timber, large enough, when hollowed out, to contain one hundred and fifty pounds of powder, with the apparatus used in firing it, and was secured in its place by a screw, turned by the operator. A strong piece of rope extended from the magazine to the wood screw above mentioned, and was fastened to both. When the wood screw was fixed, and to be cast off from its tube, the magazine was to be cast off likewise by unscrewing it, leaving it hanging to the wood screw; it was lighter than the water, that it might rise up against the object, to which the wood screw and itself were fastened.

Within the magazine was an apparatus, constructed to run any proposed length of time, under twelve hours; when it had run out its time, it unpinioned a strong lock resembling a gun lock, which gave fire to the powder. This apparatus was pinioned, that it could not possibly move, till, by casting off the magazine from the vessel, it was set in motion.

The skilful operator could swim so low on the surface of the water as to approach very near a ship in the night, without fear of being discovered, and might, if he chose, approach the stem or stern above water, with very little danger. He could sink very quickly, keep at any depth he pleased, and row a great distance in any direction he desired, without coming to the surface, and when he rose to the surface, he could soon obtain a fresh supply of air, when, if necessary, he might descend again and pursue his course.

EXPERIMENTS.

In the first essays with the submarine vessel I took care to prove its strength to sustain the great pressure of the incumbent water, when sunk deep, before I trusted any person to descend much below the surface; and I never suffered any person to go under water without having a strong piece of rigging made fast to it, until I found him well acquainted with the operations necessary for his safety. After that I made him descend, and continue at particular depths, without rising or sinking, row by the compass, approach a vessel, go under her, and fix the wood screw mentioned before into her bottom, etc., until I thought him sufficiently expert to put my design into execution.

I found, agreeably to my expectations, that it required many trials to make a person of common ingenuity a skilfull operator; the first I employed was very ingenious, and made himself master of the business, but was taken sick in the campaign of 1776, at New York, before he had an opportunity to make use of his skill, and never recovered his health sufficiently afterward.

ATTEMPT TO SINK A BRITISH SHIP OF WAR.

After various attempts to find an operator to my wish, I sent one, who appeared more expert than the rest, from New York, to a fifty gun ship, lying not far from Governor's Island. He went under the ship, and attempted to fix the wooden screw into her bottom, but struck, as he supposes, a bar of iron, which passes from the rudder hinge, and is spiked under the ship's quarter. Had he moved a few inches, which he might have done, without rowing, I have no doubt but he would have found wood where he might have fixed the screw; or, if the ship were sheathed with copper, he might easily have pierced it; but not being well skilled in the management of the vessel, in attempting to move to another place, he lost the ship; after seeking her in vain, for some time, he rowed some distance, and rose to the surface of the water, but found daylight had advanced so far, that he durst not renew the attempt. He says that he could easily have fastened the magazine under the stern of the ship, above water, as he rowed up to the stern, and touched it before he descended. Had he fastened it there, the explosion of one hundred and fifty pounds of powder (the quantity contained in the magazine) must have been fatal to the ship. In his return from the ship to New York he passed near Governor's Island, and thought he was discovered by the enemy on the island; being in haste to avoid the danger he feared, he cast off the magazine, as he imagined it retarded him in the swell, which was very considerable. After the magazine had been cast off one hour, the time the internal apparatus was set to run, it blew up with great violence.

Afterward, there were two attempts made in the Hudson River, above the city, but they effected nothing. One of them was by the afore-mentioned person. In going toward the ship, he lost sight of her, and went a great distance beyond her; when he at length found her, the tide ran so strong, that, as he descended under water for the ship's bottom, it swept him away. Soon after this the enemy went up the river, and pursued the boat which had the submarine vessel on board, and sunk it with their shot. Though I afterward recovered the vessel, I found it impossible, at that time, to prosecute the design any farther. I had been in a bad state of health, from the beginning of my undertaking, and was now very unwell; the situation of public affairs was such, that I despaired of obtaining the public attention, and the assistance necessary. I was unable to support myself and the persons I must have employed, had I proceeded. Beside, I found it absolutely necessary that the operators should acquire more skill in the management of the vessel, before I could expect success; which would have taken up some time, and made no small additional expense. I therefore gave over the pursuit for that time, and waited for a more favorable opportunity, which never arrived.

Alabaster and Plaster of Paris.

Alabaster is a compact gypsum, and occurs massive, with a compact fracture; it is translucent; has a glimmering luster, and its colors are white, reddish, or yellowish.

The purest kinds of this mineral are used in Italy for vases, cups, candlesticks, and other ornaments. It is found at Castelino, in Tuscany, thirty-five miles from Leghorn, at two hundred feet below the surface of the earth.

The yellow variety, called by the Italians *alabastro agatato*, is found at Sienna; another variety of a bluish color, obtained at Guercieto, is remarkably beautiful, being marked with variegated shades of purple, blue, and red. These alabasters are carbonates of lime.

The principal manufactory of alabaster ornaments is at Valterra, thirty-six miles from Leghorn, where about five thousand persons live by this kind of labor. In making, they require great care, and must be preserved from dust, as the alabaster is difficult to clean. Talcum, commonly called French chalk, will remove dirt, but the best mode of restoring the color, is to bleach the alabaster on a grass plat. Gum water is the only cement for uniting broken parts.

Plaster of Paris is likewise a compact gypsum, but contains a small portion of carbonic acid, which makes it effervesce when treated with acids. It was formerly exported only from Montmartre, near Paris, hence its name; it is much used in ornamenting rooms in stucco, in taking impressions of medals, in casting statues, busts, vases, timepiece stands, candelabras, obelisks, and for many other purposes.

The common plaster of Paris is ground after being calcined; and in this condition it has the property of forming a pliable mass with water, which soon hardens, and assumes the consistency of stone.

Oriental alabaster is not a sulphate but a true carbonate of lime, and on account of its peculiar tint and transparency, and as it appears that it was formed similar to stalagmite, it was called by the ancients, alabaster.

M. KRUPP is about to construct, at his works at Essen, a single-acting steam hammer, far exceeding in size any now in existence. The design for this hammer—which will have a head weighing 120 tuns—have already been prepared, and the patterns are now in hand. At present, the largest hammer at M. Krupp's enormous establishment is one with a 50-tun head, falling nine feet, six inches. This is a single-acting hammer—the only one on the works, all the others being double-acting. The smaller hammers have heads varying from twenty-five tuns downwards. In addition to these, M. Krupp has also some peculiar tilt-hammers, in which a steam cylinder is placed between the head and fulcrum of the hammer, and the piston working in this cylinder is directly coupled to the hammer shaft by a connecting rod.

The Wondrous Textile Fabrics of Hindoostan.

In the manufacture of muslin the Hindoos surpass all other people, as they do in the manufacture of the Cashmere shawl. There is a class of muslin termed "woven air," the fabric of which is so marvelously fine that the Hindoos themselves are fond of relating all kinds of strange theories respecting it.

Mr. Bolt, in his "Consideration of the Affairs of India," speaking of the Dacca muslins, says that according to report, the Emperor Aurungzebee once "was angry with his daughter for showing her skin through her clothes, whereupon the young princess remonstrated in her justification, that she had seven *japlithz*, or suits, on; another tale was to the effect that, "in the Nabob Allaverdy Kahwan's time, a weaver was chastised and turned out of the city of Dacca for his neglect in not preventing his cow from eating up a piece of "Abrovan," which he had spread and left upon the grass—the muslin, of course, being so fine that the animal could not see it upon the herbage.

So delicate is the manufacture of the short staple of the Dacca cotton, that it can only be woven into yarn at certain times of the day. The morning is generally so employed before the dew has left the grass; if spinning is carried on after that time, the spinner, who is always a woman under thirty years of age, spins the yarn over a pan of water, the evaporation of which affords sufficient moisture to prevent the fibers from becoming too brittle to handle. Delicate as the muslin is, it will wash, which European muslins will not. The durability of the Dacca muslin, notwithstanding its surprising fineness—a piece of "evening dew" one yard wide and four yards long, only weighing 556 grains—is said to be owing to the greater number of twists given to the Dacca yarn, as compared with the finest muslin yarns of England or France. The time taken to spin and weave the threads in a piece of "woven air" is very great; the reader will not therefore be surprised to hear that it sells at the rate of a guinea a yard.

The "Abrovan," or "Running Water," is considered the second class of muslin; "Sabaum," or "Evening Dew," is the third quality. It is so called because it is so fine that it can scarcely be distinguished from dew upon the grass. There are several other very fine Dacca muslins that are known by distinctive names, but these so poetically designated are the most famous. The Daghdhobees, who remove iron mold from this precious material, use the juice of the amroold plant for that purpose; and to remove other spots or stains a composition of ghel, lime, and mineral alkali. There are Mahommedans who also repair this "woven air" with a skill equal to that of the Hindoo, who weaves it. For instance, it is said that an expert Rafuger, or darner, "can extract a thread twenty yards long from a piece of the finest muslin of the same dimensions, and replace it with one of the finest quality." It is said that they execute their finest work under the influence of opium.

A still more exquisite and expensive work of the Indian loom is the figured muslin. A piece of this fabric measuring twenty yards, made in 1776, cost as much as £56. The splendid yet subdued effect of weaving gold and silver thread into the different fabrics made in India has never even been approached by Europeans. Some of their silks have a sheen upon them like the breast of a pigeon, or indeed of the Impeyan pheasant. In nature we never find that even the most splendid effects offend the eye by appearing harsh. The Indian artist seems to have caught the very art there is in nature, and he uses his gold and silver with a caution, a prodigality, and an economy fitted for the occasion. The native never throws away gold where it will not be seen. Thus on the turban cloth only the end that hangs down by the neck is thus ornamented; in the waistcloth the fringed end, etc. The gold thread is so very pure that it never tarnishes, and it washes just as well as the other threads of the garment. The thread of the precious metals is called kullabutoon, and is manufactured wholly by hand.

The embroidery in the woven garments in which this absolutely pure gold is employed never tarnishes—a perfection to which European fabricators have not yet attained.

[We have seen a vail brought by Gov. Thomas H. Seymour —who was for six years our Minister to St. Petersburg—from Tartary, which, although one yard wide and three long, would float in the atmosphere for an appreciable time before descending to the floor.—EDS.

The Limits of the Human Ear.

Prof. Tyndall, in a course of lectures on "Sound," delivered before the Royal Institution of Great Britain, states that the perception by the ear of musical sounds and the range of hearing in general is limited by quite narrow bounds.

Savart fixed the lower limit of the human ear at eight complete vibrations a second; and to cause these slowly recurring vibrations to link themselves together, he was obliged to employ shocks of great power. By means of a toothed wheel and an associated counter, he fixed the upper limit of hearing at 24,000 vibrations a second. Helmholtz has recently fixed the lower limit at 16 vibrations, and the higher at 38,000 vibrations, a second. By employing very small tuning-forks, the late M. Depretz showed that a sound corresponding to 38,000 vibrations a second is audible. Taking the limits assigned by Helmholtz, the entire range of the human ear embraces about 11 octaves. But all the notes comprised within these limits cannot be employed in music. The practical range of musical sounds is comprised between 40 and 4,000 vibrations a second, which amounts, in round numbers, to 7 octaves. "The deepest tone of or chestra instruments is the E of the double bass, with 41¼ vi brations. The new pianos and organs go generally as far as C^{I} with 33 vibrations; new grand pianos may reach A^{II} with C^{I} with 33 vibrations; new grand pianos may reach A^{II} with 27½ vibrations. In large organs a lower octave is introduced reaching to C^{II} with 16½ vibrations. But the musical character of all these tones under E is imperfect, because they are near the limit where the power of the ear to unite the vibrations to a tone ceases. In highth the pianoforte reaches to a^{IV} with 3,520 vibrations, or sometimes to c^{V} with 4,224 vibrations. The highest note of the orchestra is probably the d^{V} of the piccolo flute, with 4,752 vibrations."

Rule of the Road for Steamers.

The following lines seem to be admirably adapted for the purpose of preventing collisions at sea. They are calculated to imprint upon the minds of mariners the "Rules of the Road for Steamers," more vividly and indelibly than any other process would effect. The author will achieve as great an amount of fame as he who paraphrased the days of the months, and the number of days in each:—

1. Two steamships meeting end on, or nearly end on.

Meeting steamers do not dread
When you see three lights ahead!
Port your helm, and show your Red.

2. Two steamships passing.

For steamers passing, you should try
To keep this maxim in your eye:—
Green to Green—or, Red to Red—
Perfect safety—go ahead!

3. Two steamships crossing. This is the real position of danger. The steamship that has the other on her own starboard side shall keep out of the way of the other. There is nothing for it but good look-out, caution, and judgment.

If to starboard Red appear,
'Tis your duty to keep clear;
Act as judgment says is proper:—
Port—or starboard—back—or, stop her!

But when on your Port is seen
A steamer with a light of Green,
There's not so much for you to do,
The Green light must keep clear of you.

4. All ships must keep a good look-out, and steamships must stop and go astern, if necessary.

Both in safety and in doubt
Always keep a good look-out;
Should there not be room to turn,
Stop your ship, and go astern.

—*Mechanics' Magazine.*

Subjugating an Elephant.

Recently, a Cincinnati paper says, a circus elephant, thirty-six years old, 10,000 pounds weight, and named Tippoo Saib, while in winter quarters at Connorsville, Indiana, became unruly on account of a change of his keeper, and went to war against all mankind. He would allow no one in his quarters, and struck at every one who approached him with his trunk and tusks most violently. His keeper determined to subdue him, and the process and result are thus described: The new keeper, with nine assistants, had fully equipped himself with chains and cables for tying, and spears and pitchforks for subduing Tippoo. The first thing done was to fasten a brick-bat to the end of a rope and throw it over the end of the tusk-chain, which latter is fastened to one leg and one tusk. By means of this rope a 20-tun cable chain (formerly used to subdue the famous Hannibal) was slip-noosed around the tusk. Next, an excavation three feet deep was made under the sill of the house, and while the elephant's attention was attracted to the other side of the room by a pail of water poured into his trough, the cable chain was passed through the excavation and fastened to heavy stakes outside. All this time the infuriated monster struck all around him with terrible ferocity, and tugged at his chain with incredible momentum. The next thing accomplished was the snaring of his hind legs. This was consummated by the slinging of fresh ropes around those two stately pillars of elephant flesh, bone and muscle, and finally, by the stealthy strategy of the keeper and another man, these ropes were fastened to stumps outside. The elephant was now sufficiently pinioned to allow the order, "Charge pitchforks," to be given. Ten men, armed with these ugly implements of offense, plunged them into the rampaging beast, taking care, of course, to avoid penetrating his eyes or joints. The tenderest spot in an elephant is just behind the fore legs, and that locality was prodded unmercifully. By means of a hooked spear sunk in his back, Tippoo was brought to his knees, but he surged up again with such awful strength that he swept his tormentors off their feet and made his chains whistle like fiddle-strings. After an hour's fighting he was brought down on his side, but for two hours longer he tugged at his chains with frenzied obstinacy. He pulled so hard at times that his hind legs were straight out behind him, and three feet off the ground. At the end of three hours the giant gave in by trumpeting, which is the elephant's way of crying enough. The moment this peculiar cry was heard the battle ceased. The keeper made Tippoo get up and lie down a number of times, and he was as obedient to the word of command as a gentle pony. The animal was then groomed and rubbed off with whisky. He allowed all manner of liberties without so much as flapping an ear. He was a subjugated elephant.

Scotland's Pebbles.

Scotland can boast of her pebbles and fine specimens of quartz found in the form of perfect crystals, varying in color from pure white to amber and a deep brown. Our native pebbles are of singular conformations, and are of all colors—red, green, grey, auburn, yellow, and also of the jasper kind with a mixture of colors. A curious phenomenon connected with the color of pebbles is, that each color is found only in distinct localities.

Pebbles are found in every county of Scotland, but more plentifully in Ayrshire, Argyleshire, Aberdeenshire, Perthshire, Morayshire, Roxburghshire and Mid-Lothian. There is the Arthur Seat jasper, found on Arthur's Seat; the Pentland pebble on the Pentland Hills; the Perth bloodstone on the Ochil and Moncrieff Hills; the Montrose grey pebble at Montrose, and so on. A small rivulet in the land of Burns contributes one of the richest and finest specimens that is to be found in Scotland. The Arthur Seat jasper deserves special notice, being rich in color and variegated in streaks. It is found in large quantities on the face of the hill. On the top of the Cairngorm ranges, in Aberdeenshire, the cairngorm stones or crystals are found in great abundance. Not many years ago the Scotch amethyst could be plentifully procured and cheaply purchased, but now it is becoming scarce, and brings in the market from 50s. to 60s. per ounce. Another favorite Scotch crystal is the garnet. It has a red, or port wine color, and is found in very small quantities, of no great size, at Elie Point and along the sands on the coast of Fife. A jewel in which the yellow cairngorm, the lilac amethyst, and the pink or red garnet is harmoniously combined, is remarkably fine. Our moss agate is not the least beautiful and valuable of gems, and for certain styles of setting it is peculiarly suitable. But the chief of our Scottish gems is the pearl. There was a tiara finely set in gold and enamel in the Dublin Exhibition, valued at £500, made of Scotch pearl. Fine specimens of pearls are found in the rivers Forth, Teviot, Clyde, Earn, Tay, Tweed, and the rivers of Ross and Sutherlandshires. A fine specimen not larger than a pea will bring £25, and larges ones will command at times as much as £80 or £90.—*London Mining Journal.*

South American Coal Mines.

Coal exists at various localities along the Pacific coast, from Russian America to Patagonia, and is now mined to a limited extent in Vancouver's Island, Washington Territory, Oregon, California, at Panama, in New Granada, and at the towns of Lota, Lotilla, and Coronel, in Chili. But all these coals are of later date than the true Carboniferous, and appear to be the production of periods from the Jurassic to the Tertiary. They are of all grades of the bituminous class, from the mineral pitch, or asphaltum, to the natural coke. The veins or seams are generally thin and unreliable, and subject to the imperfections natural to all coals of recent formations. But, under present circumstances, these deposits of coal are invaluable to the commerce of the Pacific.

The coal mines of Panama are worked by several English and American companies, almost exclusively for the use of the ocean steamers of the Pacific. The coal is of a soft, bituminous character, and is much inferior to the English and our Cumberland steam coals.

Though coal exists at intervals along the entire Pacific coast, it is only worked at two prominent points south of California, viz., Panama and at the Chilian mines in the northern portion of Araucania. The mines in Chili are located at the towns or bays of Lota, Lotilla, and Coronel, which lie about 200 miles north of Valdivia. The coal area is comparatively extensive, but the seams are generally thin and frequently terminate abruptly. Their dip is irregular or undulating, and mining operations are conducted by both shaft and drift. A considerable coal trade is done here, and sailing vessels are constantly being laden for various ports on the Pacific, and passing steamers generally supply themselves here. The coal is soft, and burns rapidly with great flame and smoke, but leaves only a moderate residuum, and makes no clinker.

Electrical Countries.

In a paper addressed to the Academy of Sciences, M. J. Fournet treats of a new and curious subject, viz., the electric state of certain regions. From the report of this paper, in "Galignani," it appears that in the mountains of the basin of the Rhone and their offshoots, there are some spots distinguished for their evolution of electricity, which is sometimes very remarkable; while others, though apparently identical in surface, are in a state of absolute electric neutrality. Some very striking instances of this are quoted by M. Fournet. On the night of August 11, 1854, when Mr. Blackwell was on the Grands-Mulets, at an altitude of 3,455 meters, the guide, F. Couttet, on leaving the hut, perceived the surrounding ridges apparently on fire. He immediately called to his companion to witness the scene, which was owing to a tempest. Their clothes were literally covered with electric sparks, and their fingers, when held up, were phosphorescent. At that very time Lyons was visited with a deluge of rain, and the whole day had been exceedingly stormy. In 1841, as the same guide was accompanying M. Chenal up Mont Blanc, they were overtaken by a violent storm, and found themselves enveloped, as it were, in thunder and lightning. All the stones and rocks around them emitted electric flames, and yet the summit of Mont Blanc, and the sky around it, was perfectly clear. In 1857, Saussure, Jalabert, and Pictet, were on the Breven at an altitude of 2,520 meters. They soon experienced a strange pricking sensation at their fingers' ends on stretching them out. This sensation became stronger and stronger, and at length electric sparks could be drawn from Jalabert's hat-band, which was of gold lace, and even from the knob of his cane. As the storm was raging above their heads, they had to descend some twenty-five or thirty meters, where the influence of this electricity was no longer felt. Another instance of this occurred on July 10, 1863, when Mr. Weston and several other tourists ascended the Jungfrau, and there the snow itself, which fell during the storm which overtook them, proved to be electric.

We see by a cable despatch that Brown & Level's life-saving tackle, for instantaneously lowering and detaching small boats from the sides of vessels going at full speed, has been adopted by the French navy, after a trial at Toulon. We are pleased to hear of Messrs. Brown & Level's success in introducing their most excellent invention abroad. Patents upon it were secured through this office in the United States, England, and in several countries on the continent.

Bullock's Printing Machinery.

The largest proportion of all the letter-press printing now done, is executed upon what are known as "cylinder" printing machines—a discovery which dates back to 1790, due, we believe, to William Nicholson, of England, who, about that period, took out a patent. His plan consisted in attaching the types to a cylinder, and the impression was produced by making the types press against the sheet, which was carried on another cylinder. This is the general principle upon which all of the fastest newspaper presses now operate. A modified form of cylinder press, in which the types are placed on a flat bed, while the sheet is carried on a cylinder, is very extensively employed for book and job printing.

In nearly all of the above forms of cylinder presses the paper is only printed upon one side, and is fed to the machine by hand one sheet at a time. The operation is thus partly mechanical and partly manual After the edition has been all passed through and printed upon one side, the types are changed and the second side is printed. For every printing cylinder an attendant or "feeder," as he is termed, is required. If the press has one cylinder, then one "feeder" works; if two cylinders, then two feeders.

On page 136, current volume, the reader will find an illustration of the great ten-cylinder printing presses now in use at the *New York Herald* office. It is the practice at the *Herald, Tribune, Times*, and other prominent daily newspaper offices, to run two or more of these great printing presses, and to transfer the sheets from one press, as fast as one side is printed, to the other press, thus quickly completing the press-work on both sides. To run two of these presses requires the employment of twenty men as "feeders." Their wages are about $3 a day each, so that the cost of merely placing the sheets on the press forms a great item of newspaper expense.

Many attempts have been made to get rid of this expense by rendering the cylinder presses automatic in their operation, but without much success until the rare genius of the late William Bullock, of Pennsylvania, developed new light upon the subject. In carrying out his plans he made practical use of the important and valuable patents of Mr. M. S. Beach, the present proprietor of the *New York Sun*. We have the pleasure to present herewith several illustrations of Mr. Bullock's inventions.

In his Self-feeding and Perfecting Machine the paper is supplied to the press in the form of a large roll, A, containing enough to make several thousands of newpapers. B are the type cylinders, on which the usual stereotype plates are secured; C are the inking cylinders; D the blanket cylinders, between which and the type cylinders the sheets are pressed and printed.

The operation is very simple. The roll of paper, A, having been mounted in its place, the machinery is started, unwinds the paper, cuts off the required size, prints it on both sides at one operation, counts the number of sheets and deposits them on the delivery board, E, at the rate of 8,000 to 14,000 per hour, or counting both sides, at the rate of 16,000 to 28,000 impressions, The labor is only that of placing the rolls on the press and removing the printed paper, which ordinary hands can do.

We have seen some most excellent book printing done on the Bullock machines which are at work in the government offices in Washington. They are also employed in some of the prominent newspaper offices in Philadelphia and New York. At the *Sun* office, in this city, the Bullock presses have been in use for a long time in turning out the immense daily edition of that paper. Two more presses—the same kind but of an enlarged and superior pattern—are now being introduced there.

The Bullock press promises to effect a considerable revolution in the art of printing. It is adapted to all kinds of press-work, fine or rapid. Its capacity for the rapid production of printed sheets is unequalled. Its first cost is comparatively small. But a small place or room is necessary for setting it up. The largest size is eleven feet long, six feet wide, and six feet high. Only two hands, common laborers, exclusive of pressmen, are required for its management. Being simple in construction it is not liable to get out of order and can be easily repaired.

We have seen an official report, by O. H. Reed, superintendent of the press room in the government printing office at Washington, made to John D. Defrees, Congressional Printer, in which he shows that it would require eighteen of the Adams presses to do the same amount of book-work now being executed on a single Bullock press; and that the use of this press effects a net economy of $375 a week over such Adams presses. The Bullock press prints 200,000 octavo pages in a single hour. It runs with great steadiness and uniformity, and the number of spoiled impressions average only about one-tenth of one per cent. The estimated average of spoiled sheets on the common fast newspaper presses is between one and two per cent. The ordinary presses require of the paper manufacturer that before delivery he shall cut his goods into sheets, count, wrap and tie them up in separate bundles. All this consumes much wrapping paper, twine and time, which is saved by the use of the Bullock press, as the paper is delivered in rolls just as it naturally issues from the paper-making machine, and the paper-maker is enabled to supply paper for these improved presses at from one to two cents a pound cheaper than ordinary paper. The Bullock press prints with a perfect register, and for newspaper work this is important as it permits the reduction of the blank margin of the sheet, and thus saves paper.

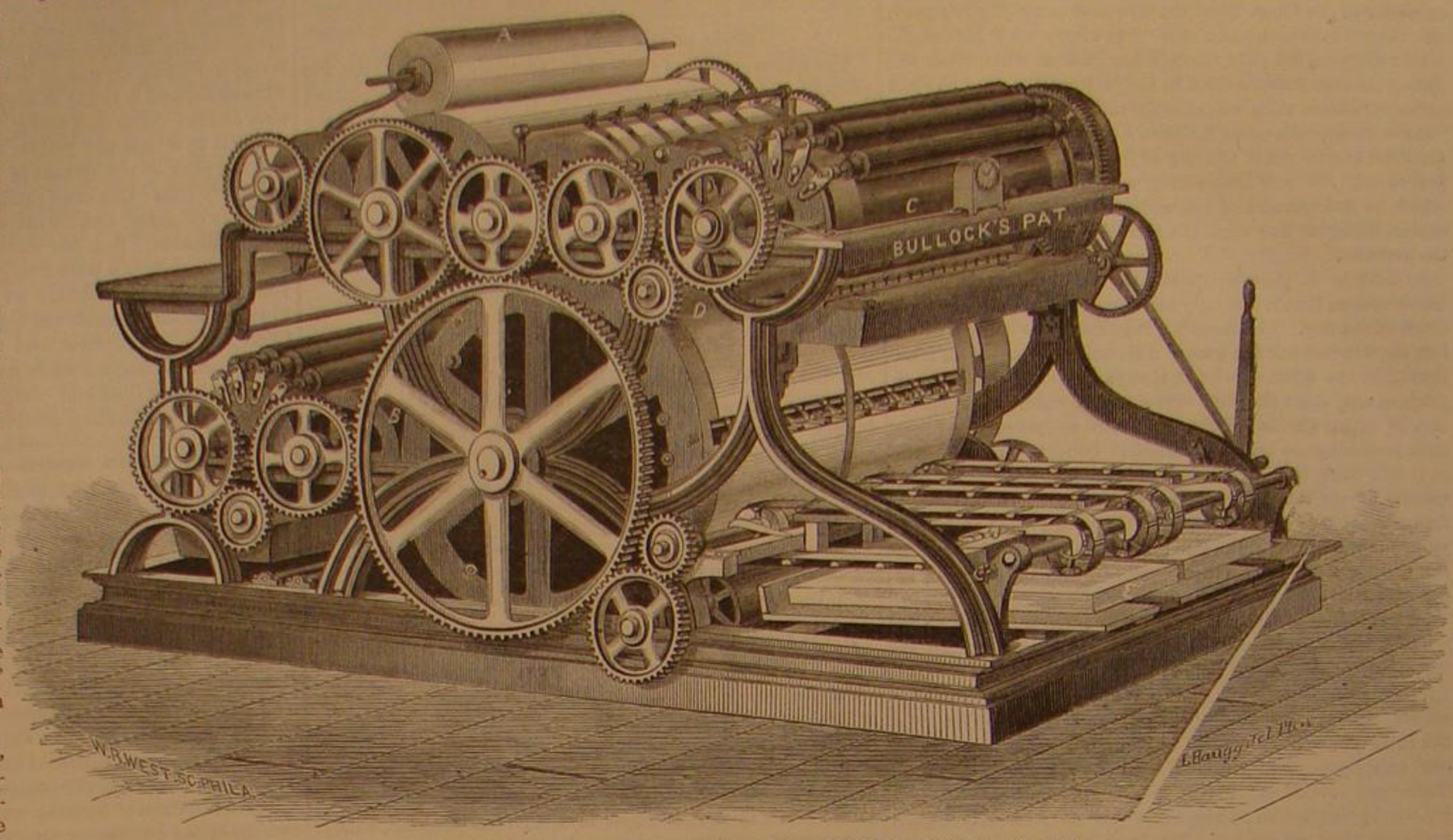
Altogether the advantages and economies in favor of these new machines are so great that, in many cases, printers might, by adopting them, be enabled to throw away their present cumbersome presses as old iron, and make a very large annual profit by the operation. Think of saving $5,000 on the press-work of a single job. This is the statement from the government office in reference to the printing of the volume of the Agricultural Report which was printed on a Bullock press.

In connection with the printing machine Mr. Bullock invented a very simple and excellent device for wetting the roll of paper, which we also illustrate. It will be readily understood by a glance at the engraving. The paper is passed from one roller to another, and midway in its passage a number of jet fountains are so arranged that their spray will fall upon the passing sheet.

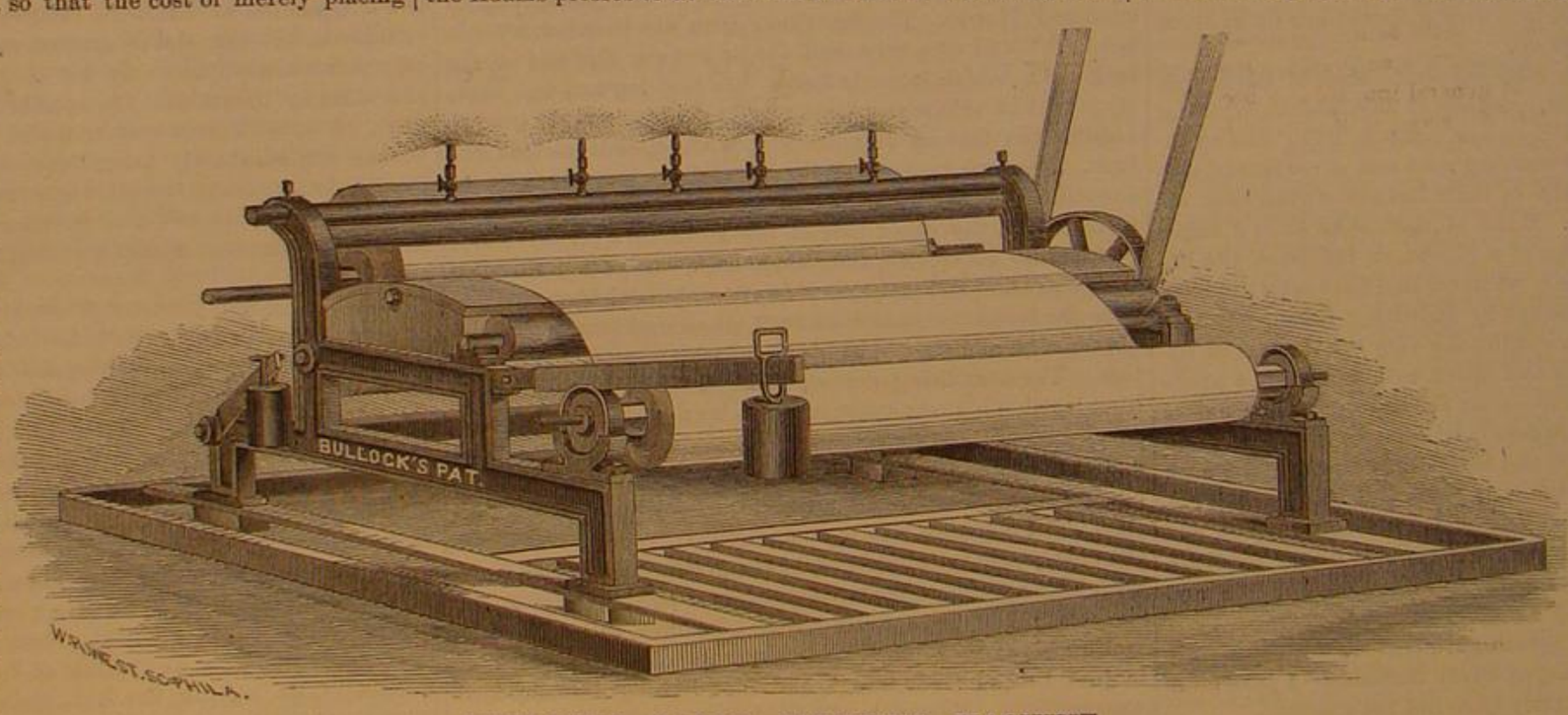
Another very ingenious improvement is the machine for shaving the backs of the curved stereotyped plates. The plate, A, rests in the concave movable bed, B, which travels under the cutter head, C. The latter rotates with great rapidity, and reduces the back of the entire plate to a perfect parallel with the type face in the short space of two minutes.

Full information concerning these valuable inventions can be obtained by addressing the Bullock Printing Press Company, 738 Sansom street, Philadelphia.

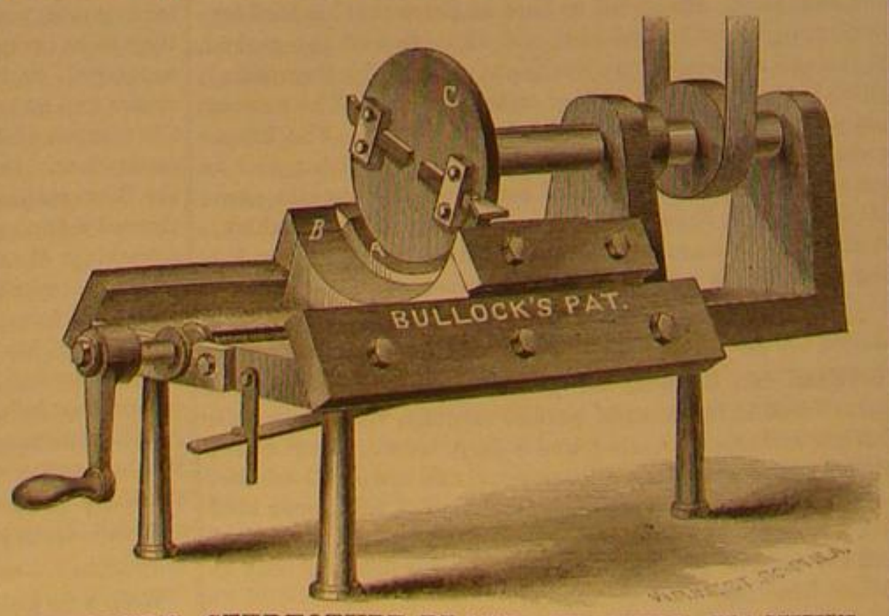
The Company manufacture several modified forms of presses, for printing both sides, suitable for small editions of books and newspapers.



BULLOCK'S SELF-FEEDING AND PERFECTING PRESS.



BULLOCK'S PAPER WETTING MACHINE.



BULLOCK'S STEREOTYPE PLATE SHAVING MACHINE.

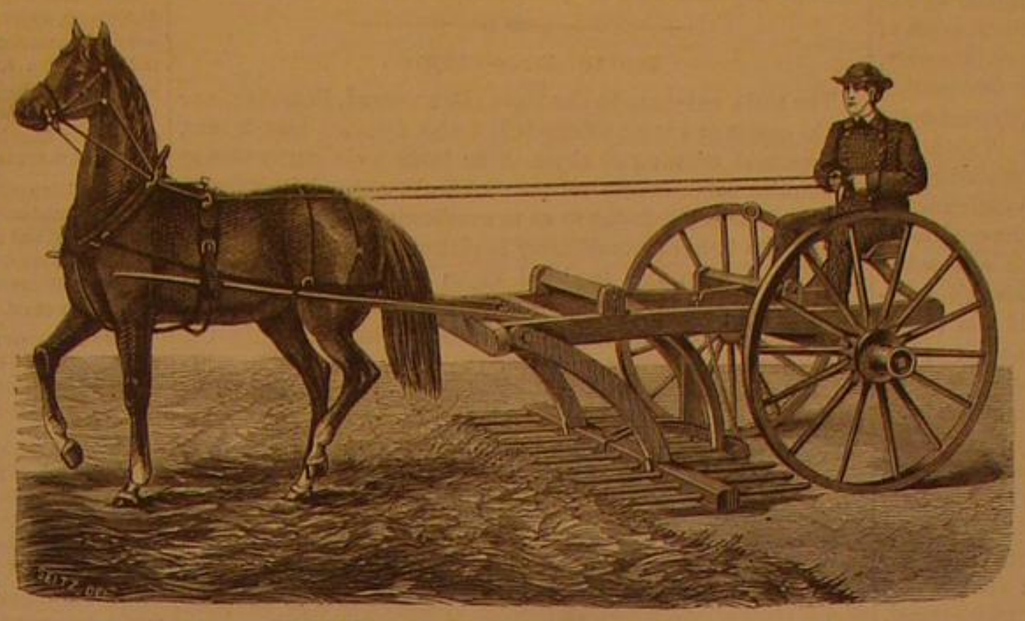
In France milk is packed in small tins, easily moved by one man, and by a simple contrivance the stopper screws close down upon the contents of each tin, so that the motion of the railway cannot churn the milk *in transitu*. The tins are then placed in covered wagons, and in summer are wrapped in cloths, which are watered from time to time, so as to promote coolness by evaporation. The result of this care, which costs but little, is that the milk supply of Paris is proverbially excellent. Why do not some of our New York milk dealers adopt this plan?

The Millionth Part of an Inch.—Mr. Whitworth has been striving to give to a committee from the House of Lords a just conception of this extremely minute subdivision of a linear space. He uses this illustration: "You have only to rub a piece of soft steel a few times to diminish its thickness a millionth of an inch.

Self-Adjustable Single-Horse Hay Rake.

One of the principal obstacles to the general adoption of the horse hay rake in some portions of the country, where the land lies in alternate hill and dale or hole and knoll, is the continual care and anxiety on the part of the driver to avoid the sudden inequalities of the ground and still gather his hay in a workmanlike manner. It is enough to do to keep the horse or horses in train without being compelled to attend also to every obstacle in the form of irregularities on the surface of the ground.

The engraving presents a perspective view of a single horse hay rake, the teeth of which are allowed to adapt themselves automatically to the surface of the ground without the direct intervention of the driver. The rake head is suspended by braces projecting downward from the front of the curved side bars, the connections being made with straps passing from the braces around bearings on the rake head. The teeth are held in position by similar curved arms which reach to the rear side of the teeth and are held by notches on the teeth. A pawl engages with two projections on the rake head, which is pivoted to the rear curved arms and is operated by a handle directly in front of the driver's seat. When the rake is loaded the driver merely pulls this handle toward him, which disengages the pawl, when the rake revolves and discharges the load, the pawl at once reëngaging with the rake head and holding it in position for gathering another load, the teeth of the rake, by the peculiarity of its suspension, allowing sufficient movement for ready adaptation to the unevenness of surface and still keeping close to the ground.



JOHNSON'S IMPROVED HAY RAKE.

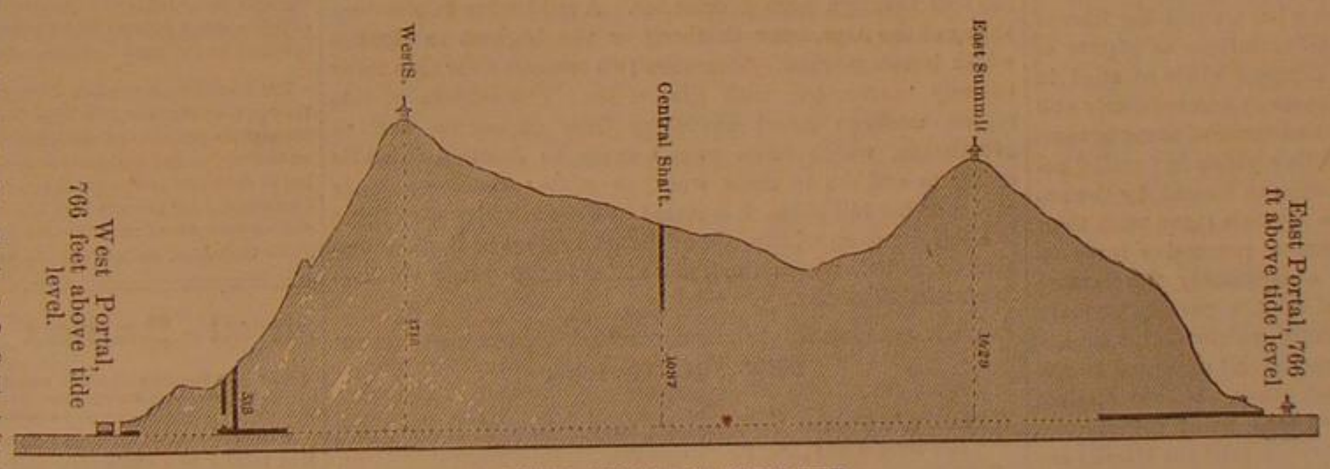
The rake cannot be thrown out of gear or revolved by this slight movement until the driver releases it from contact with the pawl, which is entirely under his control. No more definite description is probably necessary for a proper understanding of the peculiarities and advantages of the implement.

It is the subject already of several Fair premiums, although the letters patent—secured through the Scientific American Patent Agency—are dated only July 2d, 1867. Rights are for sale by the inventor, Sylvester Johnson, box 238, Evansville, Ind.

The Great American Tunnel through the Hoosac Mountain.

We reproduce a profile view of the Hoosac mountain and tunnel, from the official report of the Joint Standing Committee of the Massachusetts Legislature on the Troy and Greenfield Railroad, because great general interest has been felt in its progress, which the terrible accident of Oct. 19th has revived and stimulated.

The charter of the road known as the "Troy and Greenfield Railroad" was granted in 1848, and it authorized the construction of a railroad from a point on the "Vermont and Massachusetts Railroad," at or near Greenfield, Mass., to the line of the States of New York or Vermont, to connect with any railroad which might be constructed from or near Troy, N. Y. Its capital stock was limited to $3,500,000. The great work to be done was to construct a tunnel under the Hoosac mountain, a distance of nearly five miles, of which, on the first of January last, 5,873 feet had been bored.



THE HOOSAC TUNNEL.

The progress of the work has been greatly retarded by the inability of contractors to perform their engagements, owing partially to the errors made in calculating for the work—such calculations being more or less, from the nature of the undertaking, conjectural—and from financial difficulties. On the first of January, 1867, the excavations at the east end had reached the extent of 569 feet, at the rate of about 47.42 feet per month. But little has been done at the west end. The tunnel here must, from the nature of the strata, be sided and arched with brick, for the manufacture of which extensive brick yards have been established in close proximity. 24,000 bricks are molded daily by six brick machines.

The dimensions of the tunnel are as follows: Rock cutting, 24 feet high and 24 feet wide; the brick work, 26 feet high and 26 feet wide; the bottom of the tunnel having a culvert three feet deep, the tunnel being graded toward either end to facilitate the escape and discharge of water. In the culvert is laid a 12-inch pipe for the conveyance of air for ventilating purposes; an 8-inch pipe to carry air for the drilling machines, and a 3-inch pipe for supplying water to the holes which are being drilled. If gas is to be used for lighting purposes, it will be conveyed in a similar manner.

At the east end are two air compressors, designed to drive the drills, each having four cylinders, those of one being 13 inches diameter by 20 inches stroke, and those of the other 25 inches diameter by 24 inches stroke. They are driven by water from a canal fed by the Deerfield river, a dam across which, being a part of the work, cost $244,912.29. The central shaft is intended to afford additional means of prosecuting the work of tunneling, and also to ventilate the tunnel when completed. It is of oval form, or its cross section is an ellipse whose axes are 27 and 15 feet respectively. When completed, its depth will be 1,037 feet. More than half that distance was completed when the terrible accident occurred which sent thirteen poor fellows into eternity. As the machinery for pumping the water from the shaft was destroyed by the fire it is rapidly filling up, and work is, of course, suspended here for a time.

The west shaft has an area of 8 by 13 feet, and is 316 feet deep. The power used here is an engine of 100, and one of 40 horse power, driving a compressor of four cylinders 13 inches diameter and 24 inches stroke. On the 1st of December last the heading toward the east was advanced 1,042 feet, and that toward the west, 293 feet.

Water greatly impedes the operation of the workmen, much of the power used being employed to free the tunnel and shafts. On one occasion, at the west shaft, the workmen struck a stream which discharged at the rate of 23 gallons per minute. The pumps were unable to prevent its rise, and larger ones had to be procured. After it was pumped out, on recommencing work, another vein was struck that discharged over 100 gallons per minute. Subsequently, and after extra exertions, the water was removed sufficiently to allow the work to proceed.

The new shaft is located about 264 feet westerly of the west shaft. It is 6 by 13 feet in diameter, and will be, when completed, 277 feet deep. It is worked from both above and below. On the first of January last, those working from the top had reached a depth of 180 feet, and those from below had progressed 45 feet. At this point are two engines, one of 14 and one of 10 horse power.

After making a succession of experiments with different drilling machines, the one known as the Burleigh drill has been finally adopted. We can give no intelligible description of it without diagrams. Much, however, of the work is done by hand drilling. For blasting, Dr. Ehrhardt's powder was tried in November, 1866, but its effect was not satisfactory, a poisonous gas being evolved which drove the miners from their work. The cost of this powder is about twice that of common powder but its power for blasting purposes is superior.

Last summer, Col. Tal. P. Shaffner experimented with nitroglycerin, an account of which we gave, from the pen of Col. Shaffner, at the time. The committee from whose report we quote speak highly of its effects, and recommend it as possessing palpable advantages. The blasting is done, however, with ordinary blasting powder, these attempts to supersede its use being evidently regarded merely as experiments. The blasts are fired entirely by electricity.

From the foregoing it will be seen that this great work is "making haste slowly." A glance at the diagram, which is drawn to a scale of little over 4,000 feet to the inch horizontal, and about 1,100 vertical, will show that with the methods hitherto employed it is almost hopeless to look for the completion of this work during the present generation. Meantime, however, some more rapid method of boring and mining may be introduced which may make what seems at present a task of almost infinite labor, one comparatively easy of successful accomplishment. We sincerely hope such may be the case.

Ancient Roman Draining Wheel.

The Paris *Presse* relates the discovery, in one of the mines of Portugal, of an old wheel which was doubtless employed by the Romans to raise water in the operation of draining the mine. It is well known that the hydraulic works of the Romans surpassed in extent any of those of modern times. As that great people had not the use of either steel or gunpowder, they were sometimes obliged to raise water over a ledge, where modern engineers would carry it right through. In some of the mines of San Domingo were dug draining galleries nearly three miles in length, but in some places the water was raised by wheels to carry it over the rocks that crossed the drift. Eight of these wheels have recently been discovered by the miners, who are now working the same old mines. These wheels are made of wood, the arms and felleys of pine, and the axle and its supports of oak, the fabric being remarkable for the lightness of its construction. It is supposed that these wheels cannot be less than one thousand and four hundred years old, and the wood is in a perfect state of preservation, owing to its immersion in water charged with the salts of copper and iron. From their position and construction these wheels are presumed to have been worked as treadmills by men standing with naked feet upon one side. The water was raised by one wheel into a basin, from which it was elevated another stage by the second wheel, and so on for eight stages. The wheel is on exhibition at the Academy of Arts

The Siemens Process.

Although the new mode of steel manufacture recently patented by Mr. C. W. Siemens has not as yet obtained a commercial standing or importance, it is attracting considerable attention on the part of metallurgists in this country and abroad. The Siemens process consists in reducing the iron from its ores by the action of gases containing a surplus of carbon, and elevated to a high temperature by the combustion of a part of these gases. It is, in fact, the action of a reductive flame, such as used very frequently in metallurgic operations on a large scale, or such as can be produced on a small scale by means of the blowpipe. This flame deprives the metal of the oxygen and other elements combined with it in the ore, and brings it down in a molten state, as cast iron if charged sufficiently with carbon and tapped at a low temperature, or as steel if the proportion of carbon be smaller, and the temperature of the furnace sufficiently high for keeping this steel in a liquid state. The process in its abstract and theoretical *rationale* is one of great scientific beauty. It attempts to treat with the materials in the most direct manner, avoiding all the different makeshifts and imperfections which are included in the present practice of iron smelting. In its practical development, the Siemens process has not as yet passed its infancy. Experiments have been made by Mr. Siemens in his model steel works at Birmingham apparently on a very small scale, and a small piece of steel made by his process is exhibited at Paris. The Barrow Steel Works have commenced experimenting on a much larger scale, a furnace which, according to present notions, may be considered a full-size specimen for practical work, having been erected in these steel works, and some charges of hematite ore having been smelted or reduced into steel in this furnace. Some ingots are said to have been produced, but the facts relating to the manner of working, and the lessons drawn from these first experiments, cannot be published yet. The furnace, we understand, is now about to be altered, and further experiments will be made with it shortly. At the recent visit of the guests of the Furness Railway Company to the Barrow Steel Works, this new furnace, although not in operation, and so far under reconstruction that very little of its internal arrangement remained visible, seemed to be regarded as an object of great interest by several visitors.

The question naturally arises, what are the practical advantages to be expected from this new process? but this cannot be answered otherwise than in very general terms at this early date. It is likely that the production of steel by the Siemens process will require less carbon than the present mode of first over-carburizing the iron, and then decarburizing it by a special and second process. It is also clear that the application of gaseous fuel will make the quality of iron much less dependent upon the quality of the fuel, since the very worst kinds of fuel can be made suitable for smelting by generating gases, and purifying the latter before they come in contact with the ore. The formation of a suitable slag in the process of smelting will, in an equal degree, lose its importance, since the iron in the Siemens furnace does not require a similar protection against any oxidizing influence, as is the case in the blast furnace in front of the tweers. The only condition which seems to come out more prominently and more forcibly in the Siemens process than in the present practice of iron smelting and steel making is purity of the ore. This, however, seems to become more and more a primary condition with iron smelting in its present form, and will not, by itself, interfere with the prospects of success of the new process, if all the other necessary conditions will be fulfilled in a sufficiently practical manner.—*Engineering*.

AN ACCURATE AIM.—After some experiments with the old musket in 1838, the committee of officers drew up a table of "instructions for soldiers" in firing with it. Among other things the soldiers are told, "in firing at a man at 600 yards, always aim 130 *feet above him*." A note in *The Engineer* is our authority.

Steel Under the Microscope.

An experienced steel maker can estimate very closely the precise quality, chemical composition, tensile and compressive strength, and even the mode of treatment which a steel has undergone, by looking at its fracture. The appearance of the crystalline texture which is more or less discernable by the naked eye, and the method in which the reflected light gives certain variations of luster, are the scanty yet very important indications from which, by a series of guesses as to probabilities, an opinion may be formed which has every chance of being correct. This being the case, it seems very obvious that, by the assistance of the microscope, we should be capable of observing the texture of steel and iron fractures more correctly and more minutely, and a smaller amount of experience or nicety of observation should be sufficient—should enable us to form a correct opinion of the qualities of any given sample of steel. This is the case, and to such an extent that it is most astonishing how metallurgists could have neglected the use of the microscope to such an extent as it generally has been. We have already drawn attention in this journal to the interesting researches made by M. Schott, the manager of Count Stöllberg's foundery at Ilsenburg, upon the appearance of liquid and solidifying cast iron under the microscope, and we can quote the experience of this metallurgist as to the advantages to be obtained from microscopic observation of various kinds of steel. M. Schott, at his visit to the Paris Exhibition, made some most remarkable "guesses," as some steel-makers would call his conclusions, with regard to the qualities and method of manufacture of many hundreds of steel samples exhibited there, and of which he, in many cases, had no other knowledge than that which he could gather through the aid of a small pocket microscope, made of two pieces of rock crystal, formed into a very powerful single lens. A pocket microscope of this kind ought to be the companion of every man interested in steel manufacture. Lenses of the usual kind, even if piled up in sets of three or four, are entirely insufficient. The lens must be of a very small focus, and properly achromatic. A little practice is sufficient to enable the user to "see" through this lens; but it is, of course, not quite so easy to learn the meaning of what is thus seen, and to estimate from the appearance the quality of the steel inspected.

M. Schott has established for himself a kind of theory which, we believe, will be useful to those of our readers who desire to use the microscope in their researches upon the qualities of steel. M. Schott contends that each crystal of iron is an octahedron, or rather, a double pyramid raised upon a flat square base. The hights of the pyramids in proportion to their bases are not the same in different kinds of steel, and the pyramids become flatter and flatter as the proportion of carbon decreases. Consequently, in cast iron and in the crudest kinds of hard steel, the crystals approach more to the cubical form from which the octahedron proper is derived, and the opposite extreme, or the shaft wrought iron, has its pyramids flattened down to parallel surfaces or leaves, which, in the arrangement, produce what we call the fiber of the iron. Between these limits, all variations of hights of pyramids can be observed in the different kinds of steel in which these crystals are arranged more or less regularly and uniformly, according to the quality and mode of manufacture. The highest quality of steel has all its crystals in parallel positions, each crystal filling the interspaces formed by the angular sides of its neighbors. The crystals stand with their axes in the direction of the pressure or percussive force exerted upon them in working, and consequently the fracture shows the side or sharp corners of all the parallel crystals. In reality good steel under the microscope shows large groups of fine crystals like the points of needles, all arranged in the same direction, and parallel to each other. If held against the light in a particular direction, each point reflects the light completely, and a series of parallel brilliant streaks are shown all over the surface. Now, the exact parallelism of the pointed ends or of the streaks of light is one of the most decisive tests for a good quality of steel, and this is not visible quite so frequently as might be generally imagined. On the contrary, a great majority of steel fractures show crystals arranged in parallel groups or bundles, as before described, but clustered together in several distinct crystalline layers, which are not parallel to each other. The consequence is that the needle-points, visible under the microscope, appear to cross each other at certain places, or at least they point in such directions that, if elongated, these lines would cross each other at a short distance in front of the fractured surface. Wherever the crossing actually takes place, a ridge or line is generally visible to the naked eye, and the color of the two parts of the fractured surface which contain the different groups is different, since the light which falls upon one group at the proper angle for reflection will be in such a position with regard to the other group as to throw the points of the crystals into the shade. The one part of the surface, therefore, will appear bright or silvery white, while the other will look dark or grey in color. As usual, inferior specimens are more instructive than the best qualities, because there the peculiarities and faults come out most strikingly. We have seen a piece of a Bessemer steel block from a spoiled charge, in which the crystalline structure of the spiegeleisen was seen in some spaces, particularly at the edges of the air-bubbles, perfectly distinguished from the coarse-grained crystals of the mass of steel all round. This mass, moreover, contained groups of very different character within itself. In a specimen of steel or iron, made by another process, we could discover clearly defined crystals of pyrites, indicating the existence of sulphur in an unexpectedly tangible manner. Repeated melting, heating, or hammering of steel has, in general, the effect of reducing the sizes of crystals, and also of laying them more parallel. Still there seems to be a difference between the treatment which gives parallelism and that which causes the reduction of sizes in the crystals. The former seems to be principally due to the action of the heat, and repeated melting is the great panacea in this respect. The small-sized crystals, or what is called fine-grain, can be obtained by mere mechanical operations. In fact, hammering at a dull, red heat, or even quite cold, is known to produce the effect of making the grain of steel extremely fine. This is a property, however, which is lost by reheating, and at a sufficiently elevated temperature, steel seems to crystallize in large grains, which remain if it is allowed to cool slowly and undisturbed by mechanical action.—*Engineering.*

Ice in Deep Mines.

The main entrance to the pits at Dannemora, Persberg, one of the oldest and most celebrated of the Swedish iron mines, is a natural opening or abyss, of so large a circumference as to require some fifteen minutes to walk around its mouth. A scaffold is erected out so as to overhang this abyss, upon which the hoisting machinery is placed. The observer can look down into this frightful abyss upward of 500 feet, to which point the light of day extends, and beyond which all is shrouded in darkness, save when feebly illuminated by the dim lights of the miners. One of the most remarkable facts connected with this mine is the large quantity of ice which is always present there. Professor Von Leonhard, in his "Popular Lectures on Geology," says: "The deeper you go the more the ice increases. And in order to remove it from the pits it must be raised up in buckets. At some places the ice is 90 feet thick; it forms real glaciers, which are never diminished by any change of external temperature. This fact, however, should not be regarded as contradictory to another, which will hereafter be illustrated, and which is that pits become warmer in proportion to their depth. The phenomenon at Persberg, as we shall see, can be explained on natural principles. When the visitor has reached the bottom he is conducted by his guide into vaulted chambers, through immense regions of ice. Many of these vaults are so large that fifty men can conveniently work in them at the same time." This occurrence of ice in deep mines is not an isolated fact. Ice is found in the pits of Ehrenfriedensdorf, in Saxony. Leopold Von Buch tells us that formerly, in Norway, mining was prosecuted above the region of eternal snow. Wood, for the timbering, could not be had there, and its want was supplied by filling up a drift with water, and allowing it to freeze; passages were then cut through the ice as they were needed, the balance of the ice being left in lieu of wood for timbers. It is also well known, says the *Mining and Scientific Press*, that the ancient Peruvians obtained ores on the Cordilleras, in places elevated above the perpetual snow line. The mines of Rauris, in upper Austria, lie entirely within the glacier region, and most of the shafts open in eternal ice, clear as crystal; the miners' huts are surrounded with ice. On what is known as Gold Mountain one of the shafts is sunk 100 feet through pure glacier ice. A gold mine in the deep valley of the Alps, near Salzberg, is the highest in Europe which is now worked. There are two tunnels near this mine entirely surrounded with glacier ice. The miners of this region undergo great hardships from exposures, and to avalanches, which often sweep them to destruction while going to and fro to their work, or while reposing in their cabins on the hill sides. It is stated by one authority that there is a locality deep within one of the iron mines of Dannemora, already noted, where the mass of ice is 120 yards thick.—*Mechanics' Magazine.*

NEW PUBLICATIONS.

WHEELER'S HOMES FOR THE PEOPLE. Geo. E. Woodward, 191 Broadway, N. Y. Price $3.

This is one of a series of new works on architecture, just from the press of Mr. Woodward, who makes it a specialty to publish this class of literature. Gervase Wheeler, author of the work under consideration, had his manuscript ready for the press some years ago, but unfortunately the building where the work was in preparation was consumed by fire and the work of many weary months was lost. But what was this loss was the public gain, for there have been many improvements in architecture since the author's calamity, which he has introduced into the volume before us. The work is embellished with one hundred engravings of villas, cottages, and country houses of every order of architecture, with plans and estimates of cost.

WHEELER'S RURAL HOMES.

The author of "Homes for the People" has also published through Woodward, 191 Broadway, a similar but less comprehensive work entitled "Rural Homes," in which he not only illustrates plans of a number of cheap cottages, but also gives engravings of a variety of rustic furniture suitable for summer houses and lawns, such as settees, chairs, flower stands, etc. The author also gives hints as to the best mode of plumbing and heating country houses; also a form for drawing a specification and contract between the landlord and builder. Price $2.

WOODWARD'S RURAL ART. Geo. E. Woodward, Author and Publisher, 191 Broadway, N. Y. Price $1.50.

The volume before us is No. 2 of Mr. Woodward's annual, on the subject of architecture and rural art. It is not unlike Wheeler's works, noticed above, in its general character. Mr. Woodward designs to issue a work of this kind every year, adding all the new features and fashions in the construction and finish of country houses. Either of the above works will be found useful to builders or persons about to erect or furnish country houses.

HASWELL'S ENGINEERS' AND MECHANICS' POCKET BOOK. New York: Harper Brothers.

Mr. Haswell has long been known as one of our most experienced and reliable civil engineers. His Pocket Book is regarded as one of the standard works, for ready reference, in all that relates to engineering. For some time past the author has been engaged in enlarging and revising the matter contained in previous editions, and the result is now before the public. From about 300 pages he has enlarged the book to 650 closely printed pages, and we venture to say that no work of the kind has ever been produced which contained so much information upon the various branches of engineering, condensed into so small a space. The principal tables, rules, estimates, calculations, etc., employed in the mechanic arts, architecture, railroading, civil engineering, steam navigation, are given in the most convenient and intelligible form. Mr. Haswell's new book ought to be in the possession of every engineer and mechanic in the country.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

Philadelphia claims to be the greatest manufacturing city in the world, except London. In 1866 the factories there produced over two hundred million of dollars worth of staple goods.

Turkey has projected three lines of railway, the first from Constantinople to Belgrade; the second from Enos, a short distance west of Constantinople, to Varna on the Black Sea; the third from Enos to Uaknip in Northern Macedonia. The contract for them has been awarded, and the means will be furnished by English, French, and Belgium capitalists.

The gold yield for the country for the present year is about as follows: Montana $12,000,000; Idaho $6,000,000; Oregon $2,000,000; Colorado $5,000,000 Nevada $19,000,000; California $25,000,000, and miscellaneous $5,000,000. Total $74,000,000.

The common 60-seat American railway passenger car costs from $4,000 to $5,000 each, while the English style of railway coach introduced on a few of our roads cost about $14,000. There is a wide difference too, in the weight, in favor of the American car. The interest on the greater cost, and the hauling of the extra weight of the English car must be paid for by those who value exclusiveness sufficiently to use them. In cases where the English coach have been introduced here, they have not proved a profitable investment, and there is very little prospect of their being widely adopted.

The coal deposits of Russian America are pronounced valueless, the mineral being found only in small contorted seams. Iron is found in worthless beds of clay, and far up on the Konkon, gold may be obtained but under such circumstances that it is also valueless, being only workable two months in the year. Stains of copper have been found on rocks near Norton Bay, but no ledge or seam.

There is a stone quarried in Cornwall, Eng., called the Polyphant stone, which can be cut by a hand saw with ease when first mined, but in time becomes exceedingly hard. It occurs of a neutral grey color, and also of a green with red spots and is admired by architects for its chromatic effects.

The New York and New Haven railroad have just introduced a new system of warming their passenger cars, by means of hot water circulating through pipes placed under each seat. By following this plan all the heat is economized and thus keeping the feet of the passengers warm, the whole body experiences an agreeable sense of comfort. We hope to see other roads adopting this excellent mode of warming cars.

A train of thirty cars was loaded with railroad iron at the Cambria iron works, Johnstown, Pa., last week, the destination of which is a point on the Pacific Railroad over five hundred miles west of Omaha, Nebraska. The distance to be traversed is fifteen hundred miles, considerably more than half way "across the continent," and all this distance is to be traversed without transhipment of the iron.

The number of Bessemer steel converters now established in Europe, numbers 115, which are capable of producing half a million of tuns per annum. England with fifty-two converters turns out weekly 6,000 tuns. Prussia with twenty-two converters is the next greatest producer, 1,460 tuns weekly. Next comes France with twelve converters and 880 tuns; Austria, fourteen converters, and 650 tuns; Sweden fifteen converters, and 530 tuns. The Bessemer process is worked at one locality only in Belgium, and Italy has two establishments, with a very small yield.

South America does not propose to be outdone on the trans-continental question by its northern compeer. A project is on foot to extend the Valparaiso and Santiago railroad across the Andes to Buenos Ayres. A German engineer, Otto Von Armen, has surveyed the route, a company has been formed, the government has been applied to for a charter and grant of land on both sides of the track upon which they propose to establish German colonies, although liberal inducements will be held out to all other nationalities to settle there. As an instance showing how railroading pays in South America, it is stated that the road from Santiago to Valparaiso has earned during the past year the sum of $910,241, being quite an increase over the previous year.

The experimental elevated railroad in Greenwich street this city has been completed for quarter of a mile from the Battery. At the last meeting of the stockholders the engineer's exhibit of present and probable future cost, having been inspected it was unanimously resolved to proceed with the extension of the road one quarter mile further, to Cortlandt street, preparatory to its inspection by the State commissioners, as required by law.

The Massachusetts State Council, recently by a unanimous vote, annulled the contract made in July with Messrs. Dull, Gowan and White, for completing certain portions of the Hoosac tunnel, including the central shaft. They authorized the commissioners to take possession of all the tools etc., belonging to the State and to make an immediate settlement with the contractors. The reasons for this are that the bids for the contract were much too low and an increase of rates would soon be necessary, and the council are adverse to making any advance in that direction.

Recent American and Foreign Patents.

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

MANUFACTURING BRICKS.—E. W. Crittenden, Pittsburgh, Pa.—This invention relates to certain new and useful improvements in manufacturing bricks, designed for operating on a large scale, and more especially with a view of dispensing with the hard labor and expensive manipulations hitherto required in the process of brick making. The invention consists, 1st, in an improved means for crushing or pulverizing the clay, and bringing it to a proper elastic state to be molded or compressed into bricks. 2d, in an improved means for molding and compressing the clay into bricks, and 3d, in a novel and improved means for drying the compressed clay, or unburnt bricks to render them suitable for burning in the kiln.

SAFETY ATTACHMENT FOR WATCH POCKETS.—Edward Williams, New York city.—The present invention relates to an attachment to watch pockets of wearing apparel, the object of which is to prevent the abstraction or removal of the watch carried in such pocket from the same, without the knowledge or consent of the wearer or owner, thereby obviating all possibility of the watch being stolen when the person wearing it is in a crowd, or otherwise favorably situated for the operations of thieves, pickpockets, etc.; the said safety attachment being of such a nature and construction as to be easily manipulated by the wearer, and to offer no impediment to the free removal of the watch by such person.

MACHINE FOR HEADING AND SQUARING BOLTS.—Albert R. Bailey, New Haven, Conn., and Wilson W. Knowles, Plantsville, Conn.—This invention relates to a new and improved machine for heading and squaring bolts, and it consists in a novel arrangement of dies and a header, arranged to operate in such a manner that a square is formed on a bolt, contiguous to its head, of greater thickness than the body or main portion of the bolt, and the head and square formed on the bolt at one operation.

CORN PLANTER.—J. M. Sampson, Waynesville, Ill.—This invention relates to a new and improved corn planter, of that class in which the seed distributing device is operated by hand, the device being mounted on wheels, and all so arranged that a very simple, cheap and efficient corn planter is obtained.

BRUSH HOLDER.—Joseph Messinger, Springfield, Vt.—This invention relates to a new and improved holder, by which scrub-bushes may be firmly secured to a handle to admit of the brush being used without the necessity of the operator stooping over and working on the knees, as is now universally done. The invention consists in constructing the holder in such a manner that the handle thereof may be turned or adjusted in a position at right angles with the brush, or longitudinally therewith, and the holder at the same time be perfectly simple in construction, and economical to manufacture.

GATE SPRING.—W. W. Sutliff, Town Line, Pa.—This invention relates to an improvement in a spring for a gate or door, and consists of a flat, covered, metal spring, hinged at one end to the back of a gate, while the other end is free to catch in one of a series of notches in a block fastened to the post or frame of a gate or door, which spring, by its pressure, keeps the gate closed when it is not forcibly pushed open.

THILL COUPLING.—Silas Rogers, Stanfordville, N. Y.—This invention relates to a new and improved mode of connecting thills to axles, whereby the thills may be readily attached to and detached from the axle, and all rattling of the parts avoided.

DEVICE FOR CUTTING BOOT AND SHOE HEELS.—Benj. F. Goddard, Charlestown, Mass.—This invention relates to a new and improved machine for cutting boot and shoe heels, and is designed to save labor and stock in the production of that work. The invention consists of a combination of dies or cutters, of different sizes, arranged in such a manner that they may be manipulated or adjusted so that the several layers of leather composing a heel may be cut out to form a heel approximating to the desired shape, requiring but a trifling amount of trimming in order to finish it.

TOWELS.—John Cash, Coventry, England.—This invention relates to an improved method of manufacturing towels to be employed for friction of the surface of the skin of persons after bathing, or similar purposes.

HAND LOOM.—T. Henry Tibbles, Kansas City, Mo.—This invention relates to imporvements in an ordinary hand loom, and consists in a new device for operating the drivers and throwing the shuttle by the motion of the lay, with one picker staff and a shifting weight, and working the treadles by direct action of the lay, without treadles, through the medium of cam rollers.

HAND LOOM.—A. Smith and P. P. Smith, Plymouth, Mo.—This invention relates to improvements in the construction and arrangement of a hand loom, and consists in a device connected with the shuttle drivers in such a manner that the motion of the lay shall operate on the drivers to throw the shuttle, and also a device connecting the treadle shaft with the lay to work the treadle.

SNOW PLOW.—James S. Zane, Pleasant Plains, Ill.—This invention relates to an improvement in the construction of snow plows for railroads, and consists in inclined planes which are mounted on a truck and rise from the bed of the road to an elevated double mold board, which is hinged and so arranged in combination with machinery that it may be raised and lowered as required.

WINDOW JACK.—S. P. Loomis, Philadelphia, Pa.—This invention relates to an improvement in the construction and arrangement of a window jack or platform support for house painters.

BURGLAR ALARM.—D. B. Skelly, Lockport, N. Y.—This invention consists in an arrangement of springs which, when set or strained, are held in position by a small wire or thread, but when the wire or thread is broken or loosened the springs are liberated, which liberation or recoil gives the alarm by ringing a bell and discharging a pistol, and at the same time it ignits a match and lights a lamp.

CENTER BOARD.—Felix Doming, Penataquit, N. Y.—This invention has for its object to improve the construction of center boards, and make them more effective in operation.

DRILLING MACHINE.—George Downing, Schuylerville, N. Y.—This invention has for its object to furnish an improved drilling machine, simple in construction, easy to be operated, which can be so adjusted that the full force of the blow may be effective, whether drilling a shallow or deep hole, and which will drill vertical or inclined holes with equal facility.

BROADCAST SEEDING MACHINE.—Augustus Weitman, West Union, Iowa.—This invention relates to a new and improved broadcast seeding machine, and it consists in means employed to prevent the choking of the harness and also in means to insure a proper distribution of the seed and the sowing of the same in a perfect manner.

PADDLE WHEEL.—E. F. Bostrom, Newnan, Ga.—This invention relates to a new and improved paddle wheel designed for both river and sea steamers and has for its object a more efficient action than hitherto of the buckets or float boards against the water and the perfect operation of the buckets or float boards at varying depths of immersion.

HAIR PICKING MACHINE.—Franklin Frey, Liberty, Ill.—This invention relates to a new and useful improvement in the construction of a machine for picking or breaking up the matted knots of hair used for mixing with mortar to plaster houses.

AIR CHAMBER.—Richard H. Hilton, Newbern, N. C.—This invention relates to a new and improved method of constructing air chambers for pumps and other purposes where it is desired that a steady and uniform current of liquid or fluid should be discharged and the invention consists in arranging a strainer and ball valve in the chamber and also a sand trap or sediment chamber therein.

COMBINED HORSE BLOCK AND HITCHING POST.—George W. Preston, Corning, N. Y.—This invention which relates to a combined horse block and hitching post consists essentially in combining in one device made of cast iron or other suitable material a horseblock and hitching post.

COMBINED SHRINKING AND PUNCHING MACHINE.—C. V. Statler, Woodhull, Ill.—This invention relates to a new and improved method of shrinking and punching wagon tires and other articles.

FORMING AND CUTTING WIRE.—J. Wasson, Elyria, Ohio.—This invention consists in the arrangement of a hollow circular guide and in feeding rollers which are driven by gearing and in a cutting knife which may be operated by the foot whereby wire for tinners' use and for other purposes may be formed, measured off, and cut with great celerity.

CHAIR BOTTOM.—C. W. Royse, Peterborough, N. H.—This invention relates to an improvement in chair bottoms and consists in securing the overlapping ends of the network to the frame by means of wire staples.

DEVICE FOR BENDING TIRES.—Dennis Wetzel, Springfield, Mo.—This invention relates to an improved device for bending tires for wheels. It consists of a double-rimmed wheel to suit tires of different sizes.

MANUFACTURE OF WHITE LEAD.—Isaac M. Gattman, New York city.—The nature of this invention consists in manufacturing white lead by a new and improved process whereby the metal is wholly converted without waste, into white lead of great purity of color and perfect opacity in a very short time compared with the ordinary and most approved process by corrosion of the metallic lead known as the Dutch method.

BULLET MACHINE.—W. Spillman, Marion Station, Miss.—This invention relates to improved devices for forming bullets or minie balls and consists in revolving disks or rollers having one or more eccentric grooves cut in the face of their peripheries in combination with cams and impinging rollers or stationary dies so constructed and arranged as to compress and shape cylindrical sections of lead fed into the machine as to form spherical or conical balls as described.

COAL SCREEN.—Edward W. Weston, Providence, Pa.—This invention relates to an improvement in the construction of screens for separating broken anthracite coal and assorting it in different sizes, and other similar purposes.

DISTILLING SPIRITS OF TURPENTINE.—David Cashwell, Fayetteville, N. C.—This invention relates to an improvement in distilling spirits of turpentine and consists in an apparatus for applying steam to extract and expel the spirits of turpentine and rosin from crude turpentine and pine wood.

HAND LOOM.—H. M. Cooper, Lindley, Mo.—This invention relates to improvements in the construction of hand looms and consists in an arrangement of mechanism in connection with the lay or batten by the motion of which back and forth all the operations of the loom are performed, the whole structure being simple, easily regulated and kept in order, while the working of the loom is positive and effective in every part for weaving fine or coarse cloth.

WINDOW FASTENING.—Benson Mayo, Chatham, Mass.—This invention relates to an improved fastening for window blinds and consists in a device which catches and holds the blinds either open or closed alike.

DOOR AND GATE SPRING.—Knos Stimson, Montpelier, Vt.—This invention relates to a door and gate spring for holding a door or gate either open or closed, as desired.

TOILET TABLE OR STAND.—F. Kopper, New York city.—The present invention relates to improvements in a toilet table or stand, which consists in so constructing the stand that it can be folded up into a compact shape when not in use, and when to be used brought to the proper form to receive and support a foot bath or a wash bowl, or any other toilet article, or to be used for any of the ordinary purposes of the toilet.

TRY SQUARE.—J. E. Cowdery, Wheatland, Iowa.—This invention relates to an improvement in try squares, and consists in a blade held to a cross piece by a pivot and furnished with a finger pointing to a graduated scale.

IRONING TABLE.—Albert A. Chittenden, Boston, Mass.—This invention relates to an improved ironing table, and consists of a table or skirt board supported at one end upon a rail secured to the wall and setting under a bracket.

WOOD TYPE CABINET OR CASE.—Charles Aldrich, Marshalltown, Iowa.—By the present invention a cabinet or case for wood type is provided, which in its construction is simple, and in its operation convenient and most practicable, and one in which the type can be kept entirely free of dust or dirt.

TRACE BUCKLE.—A. E. Bailey and H. Nichols, Middleville, N. Y.—The buckle embraced in the present invention is extremely simple in its construction and arrangement, and in use most efficient and practicable.

HOOK FOR HOLDBACK STRAPS.—Wm. A. Bagley, Ansonia, Conn.—The holdback hook embraced in the present invention is constructed in two parts or sections, one of which is fixed to the shaft and the other arranged to swing therein, so as to open or close the same, it being made with a spring so as to fasten itself to the fixed part when brought over the same.

SNOW HORSESHOE.—Erving Carman, Schoolcraft, Mich.—This invention relates to an improvement in snow horseshoes, and consists of a spring placed beneath the hoof with a rubber between it and the hoof.

SHOW STAND.—John G. Oonk, Owensville, Ohio.—The present invention relates to an improved stand for the storing and showing of goods, etc., in stores, which consists in providing the stand or closet with a series of rollers on which the goods are wound and from which they can be unwound for being shown, etc.

HOSE GUARD.—David P. Lewis, Huntsville, Ala.—The present invention relates to a guard for the hose of fire engines when laid across a street having railroad tracks, in cases of fires, the object of which is to allow the running of the cars and at the same time afford no obstruction to the free passage of the water through the hose.

CHIMNEY.—Jos. F. Stafford, North Granville, N. Y.—The object of this invention is to prevent buildings being set on fire from burning out of the chimney. The invention consists in the employment of a damper located in the chimney near the top, and operated by means of a lever attached thereto, which is readily operated by a mere child.

STEP LADDER.—M. E. Abbott, Bethlehem, Pa.—This invention relates to a new and improved method of constructing step ladders, whereby they are rendered adjustable and so formed that the braces may be folded up in a small space.

BOW INSTRUMENTS.—George Gemünder, New York city.—This invention relates to a new manner of arranging the sound posts in violins, violincellos, base violins, tenor violins, or other bow instruments, so that a greater equality of sounds may be produced, and so that the tones may be propagated with more clearness, power, and distinctness than they could on instruments in which the ordinary sound posts are used.

ROTARY SWING.—J. N. Forrester, Bridgeport, Conn.—This invention relates to a new rotary swing, which is so arranged that the seats revolve both around a horizontal and a vertical axle; whereby a very ageeable motion is obtained, and whereby all sense of giddiness, generally created by the simple revolution around a horizontal axis is completely overcome or avoided.

HEAD BLOCK FOR SAW MILLS.—Charles H. Brookbank, Connersville, Ind.—This invention consists in the construction and arrangement of the parts by which the screw-shafts on which the head blocks slide, are operated, so that they are only revolved in one drection while the log is to be fed, the same being headed by a vertical lever, the lower end of which is pivoted to the carriage while its upper portion is connected with a horizontal sliding bar.

PUMP FOR COMPRESSING AIR.—Onofrio Abruzzo.—Harlem, N. Y.—This invention relates to a new arrangement for compressing air, in such a manner that the air can be compressed to an indefinite degree by hand or by any small power.

WASHING MACHINE.—W. W. Cox, Carbondale, Ill.—This invention consists in the manner of hanging one of the rollers around which the apron passes, said roller being arranged nearly under the corrugated roller, and is hung in dovetail blocks, which slide in corresponding grooves that are provided in the sideboards of the suds box.

CAR STARTER AND BRAKE.—John Wiley, 2d, South Reading Mass.—This invention has for its object to improve the construction of the improved car starter and brake patented by the same inventor, March 12, 1867, and numbered 62,911.

STEAM BRAKE.—Eugene Bourson, Brussels, Belgium.—This invention relates to a new apparatus for using the steam from the boilers without loss, in order to regulate the motion of the piston, and the speed of trains on deep grades, and to slacken or stop the progress of a train without resorting to the ordinary brakes. The invention consists in conducting steam directly from the boiler to both ends of the cylinders, so as to form a steam cushion on each side of the piston.

CORSET.—A. W. Webster, Ansonia, Conn.—The present invention relates more particularly to the clasps for corsets, and it consists in making the hook portion or part of such clasps of wire, bent into the proper shape therefor, whereby rivets are dispensed with, and a stronger and more reliable, as well as cheaper clasp, produced.

BRANDING IRON.—Charles Rundquist, Mankato, Minn.—The present invention consists, among other features, in a novel construction of the holder for the types, also in the form of the shanks of the types, and in the means employed for securing them in the holder.

MEAT SPIT.—Paul Fisher, Williamsburgh, N. Y.—This invention has for its object to furnish an improved spit so constructed and arranged as to be more convenient and satisfactory in use than when constructed in the ordinary manner.

CHIMNEY.—Bennett J. Goodsell, Pent Water, Mich.—This invention has for its object to furnish an improved chimney so constructed and arranged as to ventilate the room or rooms of the house, act as a spark arrester, and at the same time prevent the wind from blowing or driving the smoke down the chimney.

RUBBER SHOE.—J. Weidenman, Hartford, Conn.—This invention has for its object to furnish an improved device for attachment to rubber overshoes, to keep them from slipping down upon or working under the heel of the inner shoe.

PLOW.—Jonathan R. Davis, McKay, Ohio.—This invention has for its object to furnish an improved plow so constructed and arranged as to adapt itself to uneven ground, and so as to enable it to work close up to the upper row of plants, upon side hills, and which may be readily adjusted for use as a rigid plow or as a single plow.

MILL GEARING.—Joshua C. Cunningham, Oglethorpe, Ga.—This invention relates to the combination and arrangement of the stationary base wheel, the gear or pinion wheels, and the arms upon which they revolve, and the crown wheel, with each other, and with the main or driving shaft.

COTTON AND HAY PRESS.—Barnabas B. Alfred, La Grange, Ga.—In this invention a double-acting screw operates in combination with two slotted levers, working the follow-block with great power and velocity.

CONSTRUCTION OF STOVES OR OTHER HEATING APPARATUS FOR WARMING AND VENTILATING BUILDINGS.—Thomas Whitaker, and Joseph Constantine, Manchester, England.—The object of this invention is to obtain an heating apparatus for air or liquids, which, though comparatively occupying but a small space, presents not only a very large surface to the fire and the hot gases, which are compelled to come into contact with all the available heating surface in such a manner that nearly all the heat obtained from the combustion of the fuel is given off to the apparatus, and produces useful effect, instead of escaping for the most part through the chimney, as is usually the case.

MANUFACTURE OF TRUNKS, VALISES, ETC.—Samuel S. Ritter, Philadelphia, Pa.—The object of this invention is to manufacture a substantial leather trunk, which shall have no seams at the edges, and which may be made entirely without stitching, for the purpose of economy, strength, and durability.

SEWING MACHINE.—Caleb Cadwell, Waukegan, Ill.—This invention is designed to effect improvements in the mechanism for feeding and guiding the cloth, regulating the tension, taking up the slack thread, and winding the thread upon the spools; and in the method of retaining the spools upon their axes, and operating the shuttle.

COOLING GLASS MOLDS.—J. H. Reighard, Wheeling, West. Va.—In this invention the plunger is made hollow, and connected with a hollow piston rod, and is cooled by water injected through the piston rod. The mold is formed of two parts, between which is a narrow space. Into this space water is injected from a reservoir, when the instrument is in use, for the purpose of cooling it.

Answers to Correspondents.

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

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

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

G. H. S., of Mich.—A good way to learn to draw sketches of machinery is to copy the engravings published in the SCIENTIFIC AMERICAN. Begin with the simplest ones.

S. W. P., asks, "Can you supply me with a recipe for making a paste that will be water-proof?" No. We wish we could. Here is a chance for inventors.

E. H., of Ohio., asks if it is necessary to extend his exhaust pipe far up the smoke stack to aid his draft. We think it only necessary to introduce the exhaust pipe into the up-take and turn the end upward to produce the desired result.

J. H. G., of Ky., inquires as to the proportions of sand and hydraulic lime to make a cement to harden under water for a foundation on gravel. We can only refer him to Gillmore's "Treatise on Hydraulic Cements" published by D. Van Nostrand, 192 Broadway, New York city, as the qualities of the cements sold in the market, and the sands found in different localities vary greatly.

J. B. P., of Vt., says he has used one of "Douglas' pitcher spout pumps No. 1, the barrel being two-and-a-half inches and length of stroke four-and-a-half inches. The leading pipe is fifty-six feet in length, the hight of the pump from the water in the well twenty-five feet perpendicular. It will not work; neither will a larger size, which I tried. What is the difficulty. Will a smaller pump or larger pipe do the business?" Knowing that the Douglas pump is a good one, we can only surmise that there must have been some trouble in the connections, or that the pump, itself, needed some doctoring. Certainly any properly constructed pump the connections of which are perfect ought to lift water twenty-five feet.

B. G. K., of Md., asks for the components of the well-known Babbitt metal. Although there are superior compositions in the market, yet many of our readers may desire information on this subject. To four pounds of pure copper melted, twelve pounds of best tin (Banca is considered as pure as any) are gradually added; then eight pounds of antimony (regulus). After melting, twelve pounds more of tin are added. Powdered charcoal sprinkled over the surface of the metal in the crucible will prevent oxidation. When to be used for lining boxes one pound is sometimes melted with two pounds of tin.

A. A. W., of N. Y.—"Which is the strongest, a solid cast-iron shaft, or one with a small hole or of a larger size through the center from end to end, and would the same answer to this question be applicable to a shaft of wrought iron or steel?" In casting iron, or even steel, the outside cools and contracts more rapidly than the interior; consequently a hollow shaft of equal or the same weight is stronger than a solid shaft. Forged shafts of wrought iron and steel are not subject to the same law in the same degree.

Business and Personal.

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

Pattern Letters and Figures for inventors, etc., to put on patterns for castings, are made by Knight Brothers, Seneca Falls, N. Y.

Wanted—A second-hand low-pressure engine of about sixty horse-power. Address A. Catchpole, Geneva, N. Y.

The attention of those engaged in the manufacture of Burglar-Proof Safe Locks is called to an advertisement on our last page.

A Great Bargain.—The Patent Right of Forman's Combined Steam Baker and Reflecting Roaster, illustrated on page 312, present volume Scientific American, will be sold low, either entire or by States and Counties. Address Israel Forman, Fairmont, West Va.

Parties wishing to purchase good second-hand Portable and Stationary Engines, from four to fifteen horse-power, apply to Abram Logan, Tideoute, Pa.

Patent Office Reports.—Persons desiring Patent Office Reports can be supplied at low prices. Address Samuel C. Jones, Box 773, New York Postoffice.

Hand Machines or Planes for cutting out Match Splints, wanted. Send cuts and prices to Packard's Machinery Agency, Milwaukee, Wis.

S. G. Tufts, Maineville, Ohio, wishes the address of all parties engaged in making Hames and Plowhandles.

M. Nial, Troy, N. Y., wants address of Toy makers.

Manufacturers of improved machinery for manufacture of Cotton Batting, address; with description, T. L. Kinsey, Savannah, Ga.

Wanted—a second hand set of Tinners' tools. Address, with full description and price list, H. D. Heath, Candor, Tioga county, N. Y.

I wish to know where I can obtain Peat put up for shipment. Peat charcoal would suit me better. C. Browning, Rush Run, Jefferson county, Ohio.

E. Ware, Bayonne, N. J., wishes the address of Threshing Machine Manufacturers, especially at the West.

Fish Nets.—Manufacturers of machinery for making these articles will please address J. F. Brown, Lock Box 20, Binghamton, N. Y.

Parties desiring any kind of new apparatus invented, or drawings, etc., made, address with confidence, A. E. W., Inventor and Draftsman, 114 Fulton st., New York.

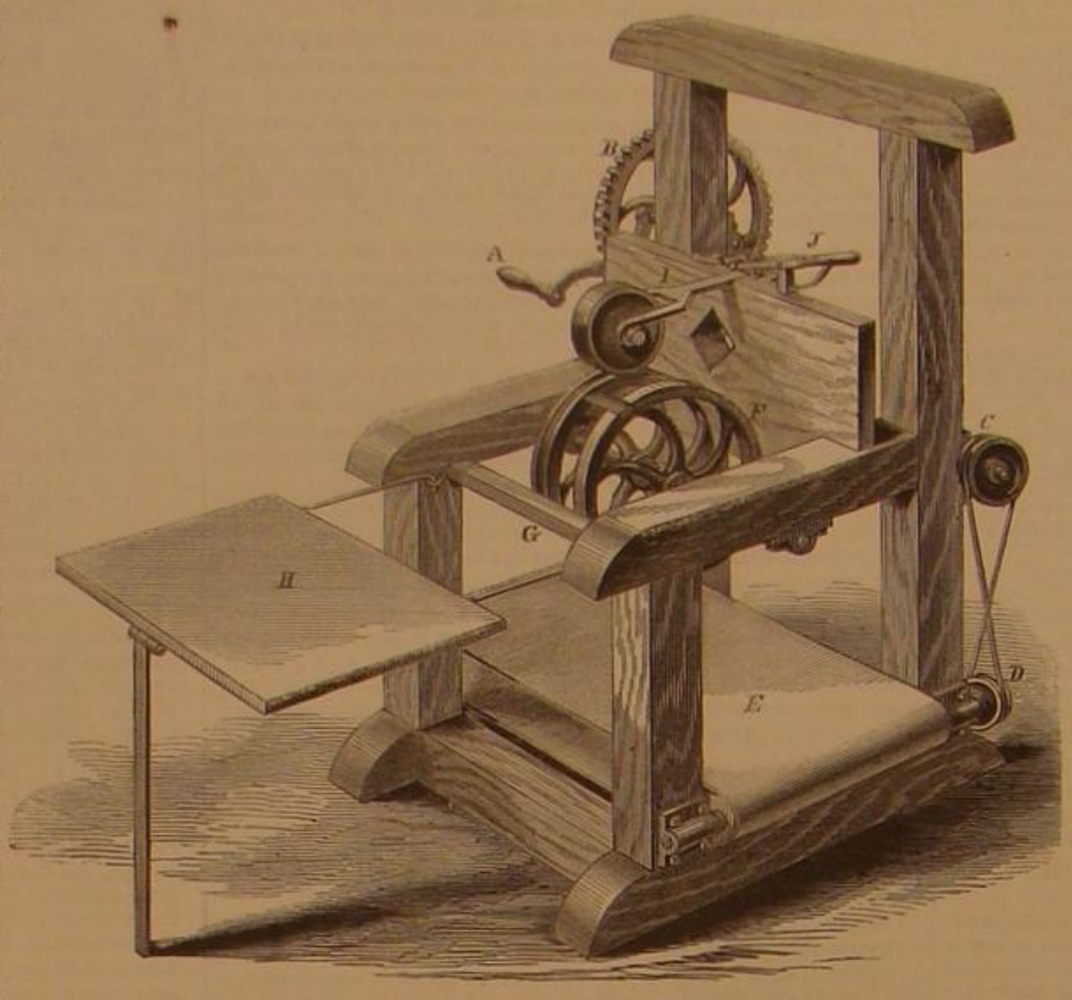
Geo. S. Hurford & Co., Canton, Ohio., wish to obtain a machine that will make small bolts with a head on both ends, in size from 1 inch long by 5-16 inch thick, up to 8 inches long by ¼ inch thick.

Machine for Topping and Stripping Sorghum and Sugar Cane.

Every additional facility for the extraction of the saccharine matter from cane or other sugar-yielding plants is of general importance, as the use of sugar is now almost universal and the demand for it constantly increasing. Sorghum, as well as sugar cane, must be stripped of its leaves before going to the crushing mill, and this work, if performed by hand labor, is slow and quite laborious. The engraving presents a view of a machine which performs this work rapidly and effectually.

The machinery is mounted on a suitable frame and is simple and easily managed. The power is applied, either by hand, through the crank, A, or by power, to the gear wheel, B, which drives the pulley, C, connecting by a belt with D, to give motion to the endless apron, E. The same shaft on which is the pulley, C, drives the shaft seen in the front part of the machine. On this shaft is a cutter wheel, F, and a grooved wheel for receiving the stalks and presenting them to the stripping knives. The topping wheel, F, has one or more knives seated in its periphery which in their swift revolution pass in immediate contiguity with a fixed curved blade on the bar, G. This device is for topping the cane, the tops falling on the apron, E, which carries them out of the machine and deposits them on one side.

The cane is laid on the table, H, between which and the frame the operator stands. After topping the cane each stalk is passed between the peripheries of the grooved wheel and the smaller one above it, which is held in connection with the former by the spring arm, I; the lower or grooved wheel being faced with rubber to insure the necessary adhesion and the upper one being either grooved or plain, this, however, being immaterial. In an upright, back of these feed wheels, is a V-shaped knife fixed, with which engages a similar one that may be elevated or depressed by the lever, J, the knife working in upright slides. This lever may be operated with a spring with sufficient tension to hold the two V-shaped knives close to the stalk. The leaves fall upon the endless apron and are carried, like the toppings, off to the side of the machine. The edges of the V-shaped knives are so beveled as to offer no opportunity of becoming clogged. The machine may be extended to any required length, as the machinery is very light and easily driven, requiring but little power.

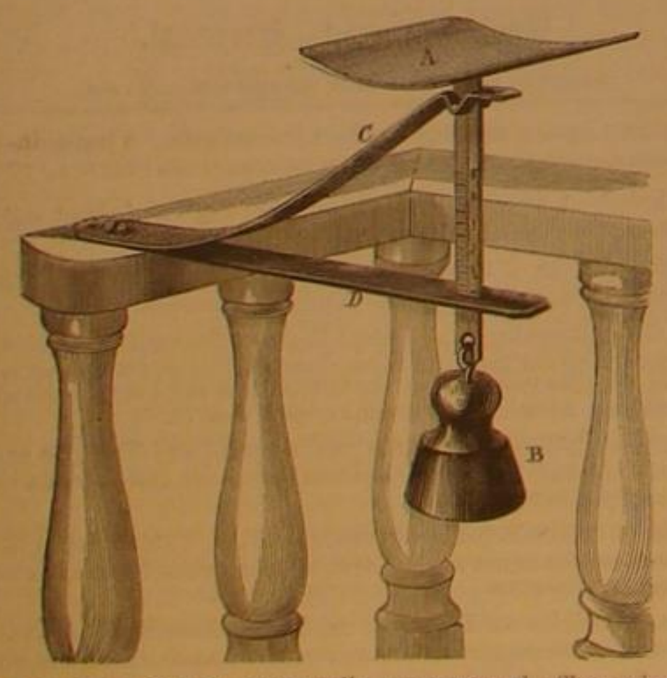


CAMPBELL'S IMPROVED CANE STRIPPER.

This machine was patented through the Scientific American Patent Agency, May 21, 1867, by James A. Campbell, who may be addressed for the purchase of State rights or the entire patent at Kent, Portage county, Ohio.

SCALE FOR WEIGHING LETTERS, PAPERS, ETC.

The engraving presents a view of a scale intended for determining the weight and therefore the postage of mailable matter, as letters, papers, pamphlets, etc. Something similar



is needed, not only in mercantile concerns and offices where the correspondence is voluminous, but also in private families, as it saves annoyance and trouble to the writers of letters, as well as to post office clerks. The device shown is intended to furnish a very cheap apparatus, which can be used at all times and under all circumstances. It can be easily described.

The scale, or receiver, A, has attached to its bottom a slip of metal graduated to ounces and their parts, and held steadily in position by a weight, B. At the upper end of this slip is a spring, C, which engages with knife edges on the upright slip, and is riveted at its other end to a support, D, through the outer end of which is a longitudinal slot allowing for the vibrating or swinging movement of the upright, which passes through it. The arrangement may be permanently secured to a desk, or railing, as seen in the engraving, or may be temporarily held when the letter is placed on the scale, A. The spring, C, is made of tempered steel, or of hard rolled brass, tested to its tension so as always to give the same results. The whole concern in itself weighs but a few ounces, and cannot, on account of its simplicity, get out of order. Patented through the Agency of the Scientific American, October 15, 1867. Agents are wanted in every city and town. Communications may be addressed to Cox & Latham, 299 State street, New Haven, Conn.

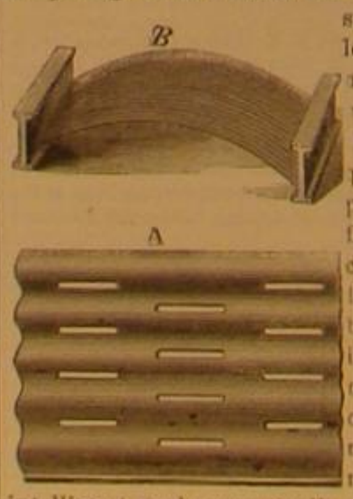
Luxurious Chair.

One of the most simple and useful improvements in household furniture that has recently come to our knowledge, is a new chair, a substitute for the rocking-chair, patented by D Witt, of Hubbardstown, Mass., on the 20th of last August, and made and sold by Dexter Howe, 169 Canal street, New York. The frame of the chair-seat rests upon two upright iron bearings, firmly screwed to the frame, the lower end resting in a socket which allows the upper portion of the chair to rock back and forth. Near the center of the bottom of the chair two coil springs are so arranged that they perform the office of rockers in an ordinary rocking chair, the bearings supporting the weight of the occupant, and admitting only the back and forward movement, which the springs assist the sitter in making. This chair possesses all the good features of a rocking chair, and is free from the objectionable features of an ordinary rocker.

ROYS' APPLICATION OF CORRUGATED IRON.

The enormous increase of strength, or resistance to strain and pressure, gained by corrugating thin iron, otherwise too weak for the purpose intended, is well known to mechanics generally; but the varied uses which iron thus treated may be made to subserve may not be so well understood. In the construction of buildings and boats it has for many years been employed, and also for roofing purposes. The engraving, however, represents its application for laths to support mortar or plaster, as well as its use for arched connections between flooring beams.

For the former purpose the ordinary thin sheet iron is employed, having holes punched through it at intervals, to allow the passage of the mortar for "clinching," as seen at A. The



sections may be made of any length or width required, and may be held to the ceiling or walls by nails or screws. For the latter, where strength is required, thicker iron may be employed in combination with iron flooring beams, as seen at B. It can be used for clapboarding, lining, siding, or roofing, as may be required, rendering the building absolutely fire proof, and immensely stronger than any brick or wooden structure. These do not exhaust the uses of this method of preparing iron, as the intelligent reader may easily see.

For these applications of corrugated iron a patent is now pending through the Scientific American Patent Agency. Communications may be addressed to F. Roys, Hoyt & Co., East Berlin, Conn., for further information.

Artificial Production of Ice.

It is not necessary for the production of ice that the temperature of the air should fall to the freezing point. Ice may be produced abundantly in all latitudes where the thermometer falls to 40° F., if proper appliances are employed; and as this temperature is reached at some period of the winter days in nearly all of our Southern States, there is no reason why the inhabitants should not provide themselves with ice houses and store up their supplies, just as we do here at the North. Large quantities of ice are made in the night time, in India, in the months of December, January, and part of February, the thermometer standing at from 35 to 40. The following description of the method employed near Benares, and equally applicable to this country, we find in the *Repertory of Arts*:—

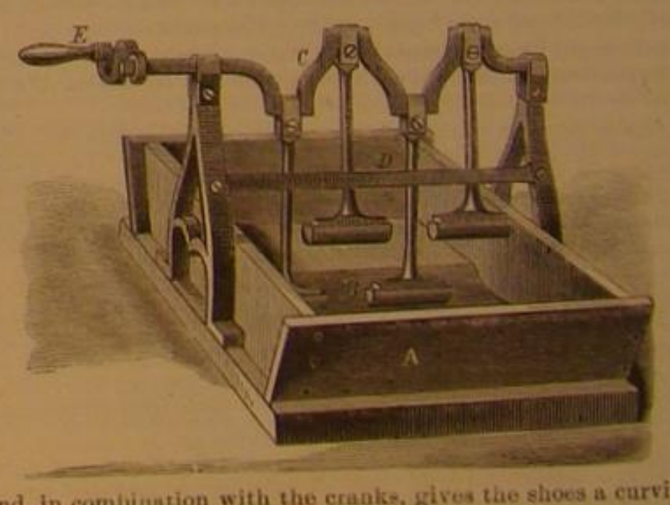
"A space of ground of about four acres, nearly level, is divided into square plats, from four to five feet wide. The borders are raised, by earth taken from the surface of the plats, to about four inches; the cavities are filled up with dry straw, or sugar-cane haum, laid smooth, on which are placed as many broad, shallow pans, of unglazed earth, as the spaces will hold. These pans are so extremely porous that their outsides become moist the instant water is put in them: they are smeared with butter on the inside, to prevent the ice from adhering to them; and this it is necessary to repeat every three or four days; it would otherwise be impossible to remove the ice, without either breaking the vessel, or spending more time in effecting it than could be afforded, where so much is to be done in so short a time. In the afternoon, these pans are all filled with water, by persons who walk along the borders or ridges. About five in the morning they begin to remove the ice from the pans, which is done by striking an iron hook into the center of it, and by that means breaking it into several pieces. If the pans have been many days without smearing, and it happens that the whole of the water is frozen, it is almost impossible to extract the ice without breaking the pan. The number of pans exposed at one time is computed at about 100,000; and there are employed in filling them with water in the evenings, and taking out the ice in the mornings, about 300 men, women, and children: the water is taken from a well, contiguous to the spot. New vessels, being most porous, answer best.

"It is necessary that the straw be dry; when it becomes wet, as it frequently does by accident, it is removed and replaced. I have wetted the straw of some of the plats, and always found it prevented the formation of ice. The air is generally very still when much ice is formed; a gentle air usually prevails from the south westward about daylight. I had a thermometer among the ice pans, during the season of making ice, with its bulb placed on the straw, and another hung on a pole, five feet and a half above the ground; and commonly observed that when ice was formed, and the thermometer on the straw was from 37 to 42°, that on the pole would stand about four degrees higher; but if there was any wind, so as to prevent freezing, both the thermometers would agree."

MORRISON'S MACHINE FOR KNEADING DOUGH.

The device in the annexed engraving is intended to supercede the direct application of muscular power rarely employed in kneading dough for bread, much less labor being required by the use of the machine and the work being more rapidly and neatly performed.

A is a box or dough receiver, having a concavity, B, extending transversely across it. On suitable uprights is hung the crank shaft, C, directly over the concavity. To each of these cranks are attached arms carrying shoes of wood at the lower end, which work in the concavity, B. They are guided by the horizontal bar, D, which forms a fulcrum for the arms,



and, in combination with the cranks, gives the shoes a curvilinear motion, by which the dough is carried under them through the box in a direction corresponding with the direction in which the shaft is turned by the handle, E.

The operation of the machine is very simple; the bottom of the box and the wooden plungers are to be covered with flour to prevent the dough from adhering, and by working the crank, the dough is compressed and carried gradually under the shoes as may be desired. It can be worked by hand or steam power, is simple, and not liable to get out of order, and can be used for working butter as well as kneading dough. Letters Patent were granted through the Scientific American Patent Agency, Oct. 1, 1867, to W. B. Morrison. For the purchase of rights or machines application should be made to Morrison & Baker, Muskegon, Mich.

THE DAY LINE—CORRECTION.—The correspondent whose diagram on the above subject we published on page 324, current volume, thinks the line is placed ten degrees too far to the east. Those of our readers interested in this subject will please notice. We merely followed the draft sent.

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THE IMPORTANCE AND DIFFICULTY OF THE PUDDLING PROCESS---LATE IMPROVEMENTS IN MECHANICAL PUDDLING.

Of all the processes in the manufacture of malleable iron, from its existence in the ore to its delivery in merchantable shapes, that of puddling is not only the most laborious and difficult, but it is probably the most important. It is in this stage of its manufacture that the quality of the iron is determined to a very great degree; no matter how excellent the pig may be, either unskillfulness or carelessness in this process will spoil the quality of the product. Those who have never seen a puddler at work, standing, as he is frequently compelled to do, from one half to three quarters of an hour before a partly opened furnace door, can scarcely form an idea of the severity of this labor. So onerous is it, that it is with great difficulty that men can be found fit for this duty, both on account of its tax on their powers of endurance and also because of the skill required in the manipulation of the partially molten metal.

The writer has seen many instances in his experience, of puddlers actually dropping down before their furnaces, prostrated and exhausted by the heat, and in one large iron establishment, numbers of these men are continually incapacitated for work by the exhaustive character of their labor. Many of them instead of feeling brisk and in good spirits in the morning before commencing their day's work actually dread returning to the works, knowing very well what suffering they will have to go through before a day of toil is finished. What makes this labor more unbearable than it otherwise might be, is the fact that it is only a part of the puddling process that requires skill, at other times the puddler is merely exhausting himself by performing manual labor.

The object of puddling, it may be well to observe, is to expose the partially liquid iron at a sufficiently high temperature, to the oxygen passing through the furnace, so that it may be deprived of its carbon, and it is in this part of the operation that the mass requires incessant stirring in order to bring every portion of it under the influence of the fire. Thus far but comparatively little skill is necessary, but when at the latter part of the operation the iron acquires a pasty consistency, the skill of the workman is demanded to form the pasty mass into the required number of balls for the rolls, squeezer, or hammer.

One of the results aimed at in the puddling process is to bring the iron up to the "boil," as it is termed, while the furnace is at its greatest temperature, and to accomplish this the most rigorous and incessant stirring is necessary, but during this stage so exhausting is the drain on the powers of endurance of the workman, that the closest oversight will not prevent him from adopting means to lower the heat of the fire, to which he is exposed, by lowering the damper, and to hurry the iron into an improper boil by throwing upon it wet slag or refuse. It is almost unnecessary to say that this treatment, if it does not ruin the product of his labor, so deteriorates it as to make what is termed cold short, a comparatively useless iron. Those who have visited iron works can scarcely fail to notice that the workmen close the dampers, in many instances as soon as the iron is melted, at the very time the highest temperature is required to carry off the superfluous carbon and other impurities. We have thus spoken at length of the puddling process in order to show its great importance and the difficulties attending it when it is carried out as it should be in order that the best quality of iron may be produced; and the reader can now fully appreciate the vast importance of the application of mechanism to this department of iron manufacture, in order not only that the puddler may be relieved of that part of his labor which requires but little skill, and that the iron may be effectually stirred while the furnace is burning its fiercest, but also to enable him to give more attention to the latter part of the operation where his skill is most required.

Several plans have been advanced to accomplish this end, and of those which we have seen, that of Morgan, of England, appears to be the most practical and to have fewer objections than any other. That a description of this apparatus may be clear to those of our readers who have not given attention to iron manufacture, we will state that the process of puddling is carried on in what is known as a reverberatory furnace; that is, one in which the material to be subjected to the heat of the fire is not brought in contact with the fuel, but is placed on a sort of hearth a short distance in front of the furnace grate, between which and the material a bridge wall intervenes. This bridge and the top of the furnace is so curved that the flame of the fire urged by a powerful draft impinges on the substances placed on the hearth. In the present case the iron is placed there and it is through a door opening upon it that the puddler performs his manipulations.

In the apparatus of Morgan a vertical shaft passes through the top of the furnace directly over the center of the hearth where the iron is placed. Fastened to the bottom of this shaft, which is kept revolving by means of bevel gearing driven by steam power is an arm fitted with four fangs or prongs, each one about the size of a puddler's "rabble." These prongs stir the iron by moving at the necessary speed, when it is in a liquid state, and thus purify or refine it much more thoroughly than can be accomplished in the ordinary way by a man poking the mass through a partially opened door. There is no necessity, by this method of closing the dampers, to reduce the draft because no one is annoyed by the unendurable temperature, but the furnaces can be urged to their utmost, and that, too, at that stage of the process which requires the greatest heat. As soon as the iron acquires its pasty consistency the mechanical "rabble" or stirring iron is withdrawn by the assistance of the usual balance weights through a hole in the top of the furnace which is closed by a fire-brick stopper. After it is withdrawn it is immersed in a tub of water which is moved to the proper place by a truck running on a track, and the stirring tool is ready for the next batch of iron. As this mechanical rabble revolves in a circle it will be seen that the hearth of the furnace, where the iron is placed, will require to be changed from the usual oval to a circular shape. This is, however, a change very easily made and one which in new furnaces would not increase the cost of construction.

To recapitulate what we have already partially stated, it will be seen that this contrivance is a step in the right direction, and if practical difficulties are not found to exist to prevent its application, the process of puddling will not only be rendered much more perfect as regards the quality of the product, but the labor of the puddler will be shorn of its horrors, and no doubt the number of heats that he is now able to get out in a given time will be increased to a very considerable extent; and still further, workmen of intelligence who would now shrink from the terrible labor of a puddler, would no doubt gladly take up with this department of iron manufacture. The consequence would certainly be a great increase in the quality of wrought iron and would perhaps enable it to hold its own in some of those branches of the arts where steel is now disputing the supremacy. We are not among those who think that steel is destined to entirely supersede wrought iron; the fibrous and ductile character of superior wrought iron has not yet been reached by the steel makers, except perhaps in rare instances, and then a considerable quantity of a uniform character could not be counted on.

There are several directions in which the successful introduction of mechanical puddling will lessen the expense of iron manufacture, among which is the saving of what is technically termed the fetling lining of the furnace; the longer the iron remains in a liquid state the more will this lining be eaten away and the iron must of course remain longer in the liquid state by the old method than by the proposed mechanical process, for the reason that by the former a very much longer time must be taken to stir it sufficiently to deprive it of its impurities than by the latter, where the stirring may be much more powerful and efficient. Before taking leave of this interesting and important department in this great industry, we must say that we cannot call to mind anything in the mechanical line which demands improvement more than the process of puddling.

A REMARKABLE SUMMER EXCURSION.

One pleasant morning last June, a goodly company of ladies and gentlemen—some 75 in number—embarked from the foot of Wall street, New York, on the fine steamer *Quaker City*, for an excursion to that most attractive of all parts of the world, the Mediterranean. Along its classic shores they coasted during the entire season, visiting every memorable and interesting place. Oftentimes they made diversions to the interior; but they were usually glad to escape from the land heats of the day, to enjoy cool and refreshing sleep on board the ship at night. They first landed at the peninsula of Gibraltar, and some of them journeyed thence through Spain, France, Switzerland, and Italy, joining the ship again at Naples. Thence they passed on to Athens, Constantinople, Sebastopol, and Odessa, at which latter place they visited the Palace of the Emperor of Russia, by whom and his interesting family they were most cordially and splendidly entertained. Returning they visited Smyrna, Beyrout, Jaffa, Damascus, Jerusalem, Sea of Galilee, the Dead Sea, Thebes, Alexandria in Egypt, the Nile, the Pyramids, Algiers, Malta, Cadiz in Spain, Madeira Islands, and the Bermudas, arriving safely home, a few days ago, after an absence of only five and a half months. It is one of the most novel, remarkable, and successful excursions that we remember to have heard of. There were no accidents, no sickness, every place laid down in the programme was faithfully explored, and not a single rainy day interfered with the projects of the party. How much more rational to spend a summer among such interesting and wonderful scenes, filling the mind with useful knowledge, than to be cooped up in a hot hotel at some fashionable watering place. The excursion we have described was projected and commanded by Capt. Duncan, of Brooklyn, N. Y. The complete success of this first enterprise will, we trust, encourage him to a renewal every year. As soon as the Pacific Railroad is completed a pleasant summer excursion may extend from New York to China, Japan, and back.

PATENTS IN CANADA TO AMERICAN CITIZENS.

We are glad to see that the subject of amending their patent laws is about the first thing that engages the attention of the New Canadian Parliament. A telegram from Ottawa dated the 22d says:

In the House last night the following notice of motion was given: Whether it is the intention of the Government to extend to citizens of the United States the same facilities for obtaining patents in Canada that are afforded to citizens of the Dominion, and whether the privileges to order patents now enjoyed by the United States in the Province of New Brunswick are to extend to other parts of the Dominion.

In addition to the above we have private advices from prominent citizens in the Provinces stating that there is but little doubt but that a bill will pass early in the session extending the same rights to citizens in the States to obtain patents as is accorded to residents of Canada.

Mr. Legge has favored us with a copy of his pamphlet showing the importance of a radical amendment in their laws. He says:

Among the British Provinces in America, we find that New Brunswick and Newfoundland have wisely shaken off the shackles of prejudice and exclusiveness, and allow all foreigners to obtain patents on the same terms as are granted to their own citizens. By this arrangement, the inhabitants of these colonies or provinces are permitted to obtain patents in the United States for the reduced fee of $35, in place of the discriminating fee of $500 charged to the inhabitants of Canada, Nova Scotia, and Prince Edward Island, in return for their exclusiveness in not permitting American citizens to obtain Letters Patent on any terms, even by the payment of an equally large fee.

The United States Patent Law is so framed that as soon as we cease to discriminate against their citizens in the granting of patents in the Dominion of Canada, their fee at once drops from $500 to $35, without additional legislation.

The proposed change in our laws, by which this good result would be obtained, will at once open a market of 35,000,000 of enterprising, wealthy, and speculative people to our Canadian inventors, as all wishing to apply could afford to pay the lesser fee of $35, while but few can pay, in the first instance, the larger fee, $500. In return for 35,000,000, given to our inventors, we give theirs but about one-tenth the number, and as our inventors, as a class, will equal, if not excel, those of the United States, in point of ability, we have a large margin in our favor, by the proposed alteration. From this it is evident that if in the new law we adhere to the exploded exclusive principle, it will result, to use a common but forcible expression, in "cutting our own throats," without doing much harm to our neighbors.

Evils of Tight Lacing.

Sometime ago the death of a young lady passenger, Miss Stainsby, in one of the cars of the London underground railway was reported, caused, as then alleged, by suffocation, due to the bad state of the air in the tunnels. A legal investigation ensued from which it now appears that one of the causes of her death was tight lacing.

Prof. Rodgers, lecturer on medical jurisprudence and on chemistry, was the first witness, and at his request the evidence of Dr. Popham as to the appearance of the body was read to him.

Dr. Popham added that he had found the deceased was tightly laced, and that the result would be to compress her chest and impede the free action of her lungs.

Prof. Rodgers said he had examined samples of air taken on four different occasions from the tunnels of the Metropolitan Railway, and also from various other tunnels. The air in its pure condition contained 2,080 volumes of oxygen per 10,000, and from 3·7 to 6·2 of carbonic acid. On the 4th of September he found that in the worst tunnel (*i. e.*, Gower street), there were 1,870 measures of oxygen, and there was but a slight trace of carbonic acid. The highest amount of carbonic acid he had found on any one occasion was 18·7 per 10,000; but the atmosphere of a theater four feet above the stage was 23·7. The slight deficiency of oxygen which he found would not act injuriously, even upon delicate persons, passing as they did, rapidly through the tunnel in trains. Thought that under the circumstances under which the deceased had entered the train—that was to say, considering that she had eaten heartily, was tightly laced, had diseased heart, and was already faint before she entered the tunnel—her death had resulted from natural causes. The jury heard other evidence, and then, without hesitation, brought in a verdict:—"Died from natural causes."

PETROLEUM TRIALS.—We trust that soon we shall be favored with exact information respecting the trials under government patronage of petroleum as a fuel for generating steam in marine boilers. The Chief of the Naval Bureau, B. F. Isherwood, will give these results in the Annual report of the Secretary of the Navy, and a more complete technical report, with full details, drawings of the boilers, etc., will be published in a few months afterward.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING NOVEMBER 19, 1867.

Reported Officially for the Scientific American

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

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

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $300 on application.

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

70,933.—STEP-LADDER.—M. E. Abbott, Bethlehem, Pa.

I claim a step-ladder, with the braces, B B', and the stay rods, C C', and D D', attached to the ladder, A, substantially as described, that is to say, by the pivot joints, d d, and the long staples, a a, and c c, as and for the purposes set forth.

In combination with a step-ladder, I claim the pivot joints, a a, and the long staples, a a, and c c, or their equivalents, substantially as and for the purposes described.

70,934.—APPARATUS FOR CONDENSING AIR.—Orlando Abruzzo, New York city.

I claim the arrangement of a series of vessels, A A', when the same are connected with cylinders, B B', the same being provided with valves, C C', and with perforated pistons, D D', having valves, substantially as and for the purpose herein shown and described.

70,935.—LAMP CHIMNEY.—E. R. Addison, Wheeling, W. Va.

I claim the combination with the glass bulb, A, of the metallic or mica chimney, D, secured by tight joints, a and e, to the upper edge of the bulb, substantially as described and represented.

70,936.—TYPE CASE.—Charles Aldrich, Marshalltown, Iowa.

I claim a cabinet or case, made in sections or parts, hung so as to open and close, and each provided with shelves, substantially as and for the purpose described.

70,937.—JOINERS' GAGE.—Mason C. Ames (assignor to himself and Jeremy W. Bliss), Hartford, Conn.

I claim, as a new improved article of manufacture, a carpenter's gage, composed of the bar, A, head, B, clamp screw, C, and constructed to operate substantially as and for the purpose described.

70,938.—HOOK FOR HOLD-BACK STRAP.—William A. Bagley, Ansonia, Conn.

I claim a hook for hold-back straps, made in two parts, B, and pivoted part, C, substantially as described.

70,939.—BOLT MACHINE.—Albert R. Bailey, New Haven, and Wilson W. Knowles, Plantsville, Conn.

We claim, 1st, The fixed jaw, O, and the sliding jaw, O', in combination with the supplemental die, Q, and die, M, all constructed and arranged to operate substantially in the manner as and for the purpose set forth.

2d, The cross head, E, slide, J, attached thereto, and independent slide, K, arranged substantially as shown, for operating the heading die, M, sliding jaw, O', and supplemental die, Q, as set forth.

70,940.—HARNESS BUCKLE.—Alonzo E. Bailey, and Horatio Nichols, Middleville, N. Y.

We claim, 1st, The trace buckle, constructed as described, consisting of the frame, D, with curved forward end, and provided on each side with stop, F, which serves as a limit to the forward movement of the sliding clasp, E, embracing the frame as herein set forth, for the purpose specified.

2d, In combination with the above, we claim the trace strap, B, when provided with the enlarged part, H, secured to the frame, D, by means of the slide, E, substantially as described, for the purpose specified.

70,941.—ELEVATOR.—Cyrus W. Baldwin, Boston, Mass.

I claim, in an elevator or hoisting apparatus, as described, the combination with the elevator carriage and rope, or other device for supporting or suspending the same, of the wedges for preventing the accidental fall of said carriage, under the arrangement and for operation as set forth.

I also claim the combination and arrangement with the carriage, A, and its supporting rope, of the levers, H H, ropes, a' a', and wedges, G G, or their equivalents, substantially in manner and for the purpose as before described.

70,942.—SCALES.—Isaac Benham (assignor to himself and Allen B. Benham), McLean, N. Y.

I claim a proportioning scale for ascertaining, in compounds of ingredients in fixed proportions, the quantity of any one ingredient, by the use of any other ingredient as a weight or measure, in the manner and by the device above set forth, as a new article of manufacture.

70,943.—APPARATUS FOR THE MANUFACTURE OF SALT.—Henry Beschkee, Albany, N. Y.

I claim the arrangement and combination of the soaking pan, K, drying pans, D and E, with the zigzag flues, f and T, when arranged and operating as herein described, and for the purposes set forth.

70,944.—BUCKLE.—Edward C. Blakeslee, Waterbury, Conn.

I claim the herein-described buckle, in which the tongues, B B, and loop, C, are formed in one piece, and so as to form bearings, a a, which are hinged to the frame in the manner set forth.

70,945.—DOOR CATCH.—Asa Blood, Jr., Independence, Iowa.

I claim the adjustable spring, C, head, E, as arranged in combination with the arms, B, for the purpose and in the manner set forth.

70,946.—WIRE WORK.—Wannibald R. Boerner (assignor to himself and Carl R. Boerner), Chicago, Ill.

I claim wire work to be used for any purpose, when constructed substantially as herein described.

70,947.—PADDLE-WHEEL.—Edward T. Bostrom, Newnan, Ga.

I claim the construction of four buckets, C, upon the revolving shaft, D, arranged upon the ends of the radial revolving arms, B, substantially as described, for the purpose specified.

70,948.—STEAM ENGINE.—Eugene Bourson, Brussels, Belgium.

I claim, 1st, Connecting both ends of a steam cylinder by means of a pipe, C, having one or more stop cocks, a, substantially as described, so as to enable the engineer to stop or retard the motion of the piston, by conducting steam or water, or both, into the ends of the cylinder, substantially as herein shown and described.

2d, The pipe, C, connecting the ends of the cylinder, when provided with the stop cocks, a a, and when combined with the blow-off pipes, c c, all made and operating substantially as herein shown and described.

3d, Connecting the two cylinders of a locomotive engine with each other by means of a pipe, F, whereby steam, water, or both, can be conducted into the ends of the cylinders, substantially as and for the purpose herein shown and described.

70,949.—CHILD'S TOY.—George W. Boynton, Auburn, N. Y.

I claim the hollow wheel, A, loop, h, weight, g, and image, B, all combined and arranged as and for the purpose set forth.

70,950.—HEAD BLOCK FOR SAW MILL.—Charles H. Brookbank, Connersville, Ind.

I claim, 1st, The rod, E, provided with the adjustable toothed slides, n, and operated by means of the lever, F, pivoted to the carriage, and connected to said rod by means of the sliding sleeve, h, and bar, g, all arranged as described, for the purpose specified.

2d, The pins, k k, and sliding sleeve, h, regulating the stroke of the lever F, whereby the movement of the head block is determined, as herein shown and described.

3d, The pinion, b, having formed upon its inner side the ratchet wheel, c, turning loosely upon the screw shaft, C, and connected to the wheel, d, by the pawl, e, and spring, f, as herein described, and operated to move the head block forward by the ratchet bar, E, and to withdraw said head block by means of the crank, l, independent of the ratchet rod, all arranged as described, for the purpose specified.

4th, The arrangement of the pivoted lever, F, connected by the bar, g, and slide, h, to the ratchet rod, E, the screw rod, C, pinion, b, ratchet, c, crank wheel, d, pawl, g, spring, f, and head block, D, as herein set forth for the purpose specified.

5th, Feeding the log to the saw the required distance at one stroke of the lever, F, through the medium of the ratchet bar, E, pinion, b, ratchet, c, wheel, d, and screw rod, C, as herein shown and described.

70,951.—MACHINE FOR GRINDING SAW TEETH.—Ira S. Brown and Charles N. Brown (assignors to themselves and J. Mason Gross) Providence, R. I.

We claim the combination of a grinding wheel, A, with an apparatus for holding the saw-tooth, or other article to be ground, which apparatus for holding the tooth or other article consists of the standard, E, the hinged frame, I I, and the vise, F, combined therewith as described, all arranged so as to effect the presentation of the article to be ground to the wheel, substantially as described.

70,952.—FAN.—Otto Brück, New York city.

I claim the tubular handle, a, into which slides the tube, b, which is adapted to receive the fan, d, in its folded state, in combination with the tube, b, head, e, fan, d, and draw strings, f and g, the whole arranged and combined substantially as herein set forth.

70,953.—MARKER FOR PLANTING CORN.—John Burnham (assignor to himself and David L. Hough), La Salle, Ill.

I claim a two-wheel marker, which is constructed so as to operate substantially in the manner herein described.

70,954.—HORSE SHOE.—Irvine Carman, Schoolcraft, Mich.

I claim, 1st, The spring, B, fitting into the walls of the shoe, substantially as shown and described.

2d, The combination of the rubber, C, with the spring, B, substantially as shown and described.

70,955.—TOWEL.—John Cash, and Joseph Cash, Jr., Coventry, England.

We claim, as a new article of manufacture, bath or friction towels, manufactured of tape, substantially as described.

70,956.—APPARATUS FOR DISTILLING SPIRITS OF TURPENTINE.—David Cashwell, Fayetteville, N. C.

I claim, 1st, The application of steam to the distillation of spirits of turpentine, as herein described.

2d, The induction steam pipe, a, the steam heating coils, b, b', and the diaphragms, c c, combined with the still, A, the steam-generator, D, and the worm, B, arranged and operating substantially as and for the purposes shown and described.

70,957.—TIP WAGON.—Stephen Chamberlin, Boston, Mass.

I claim the combination and arrangement of the body, s, rocker springs, n, journals, r, and socket bearings, s, together and relatively to the spring, l, and front and rear axles, substantially as described.

70,958.—IRONING TABLE.—Albert A. Chittenden, Boston, Mass.

I claim the movable table, A, in combination with the rod, B, and frame, C, or their respective equivalents, substantially as and for the purpose described.

70,959.—CHURN.—Charles Colby (assignor to himself and Michael O'Neil), San Francisco, Cal.

I claim the combination and arrangement of the driving shaft, B, gears, C and E, with gears, D and F, at the opposite end of the churn, with the dashers, H and K, and barrel, L, all as described, for the purpose set forth.

70,960.—DITCHING MACHINE.—Robert Conarroe (assignor to himself and Howard Young), Camden, Ohio.

I claim, 1st, The shovels of the elevating apparatus, the plates, r, of which automatically clean the plates, o, substantially as set forth.

2d, The notches, u, and pins, v, in combination, when applied to a wheel and axle, substantially as described.

3d, The plow, G, trough, F, elevating apparatus, H, e e, h h, cutters, C, and lever, w, when combined and arranged substantially as described.

70,961.—STOVE-PIPE DRUM.—Jesse Conver, Philadelphia, Pa.

I claim cylinder, c c, damper, D, holes, H H, and H' H', and K K', constructed and combined with plates, A A, B B, A' A', B' B', A'' A'', and cone plate, B'' B'', in the manner and for the purpose set forth and described.

70,962.—HORSE HAY FORK.—A. J. Cook, Guilford, Conn.

I claim the combination of the slotted rod, A, the bar, D, the lever, E, and prongs, C, when the said bar, D, extends from the said lever upon one side of the rod, through the rod to the prong upon the opposite side, substantially as and for the purpose herein set forth.

70,963.—GATE.—William Cooley, Tafton, Wis.

I claim, 1st, The lever, E, made to rest on the top of hinge, G, in combination with sleeve, S, gate, F H O V C D, and support, J, the whole being arranged substantially as set forth and for the purpose described.

2d, The combination of the sliding post, K, with gate, F H O V C D, hinges G G, lever, E, and catch, n, substantially as herein specified.

70,964.—LOOM.—H. M. Cooper, Lindley, Mo.

I claim, 1st, The combination of the lay, C, the treadle cam shaft, H, the treadles, G, the cloth beam, D, the shuttle driving hand, p, the levers, r r, the cams, s s, the spring bar, w, and the cross bar, v, constructed, arranged, and operating as and for the purposes herein described.

2d, The combination and arrangement of the lever, m, pivoted near its lower end to the frame of the loom, and provided at its upper end with the screw thread by means of which the hinged pawl, k, is raised or lowered, with the connecting rod, n, sword, C', cloth beam, D, gear wheels, g g1, g2, and ratchet wheel, h, as herein described, for the purpose specified.

3d, The arrangement of the pivoted hand, p, the levers, r r, the cams, s s, the spring bar, w, and the cross bar, v, combined with the lay, C, and the shuttle-drivers, o o, substantially as and for the purposes described.

4th, Connecting the shuttle-boxes, t t, with the lay-by hinges, as and for the purposes set forth.

70,965.—MOLD FOR MAKING CORES FOR CASTING GLOBE VALVES.—John M. Cooper, Pittsburg, Pa.

I claim the core boxes, x and x', with their respective plugs, g and g', constructed substantially as hereinbefore described, for the purpose of forming cores for casting globe valves with diaphragm valve seat.

70,966.—TRY SQUARE.—J. E. Cowdery (assignor to himself and A. S. Benson), Wheatland, Iowa.

I claim the circular rack, E, and spring pawl, e, when combined with a pivoted blade, to a try-square, in manner substantially as and for the purposes described.

70,967.—WASHING MACHINE.—William W. Cox, Carbondale, Ill.

I claim, 1st, The corrugated roller, C, in combination with the roller, F, apron, G, dovetail blocks, h, springs, k, and nuts, l, all made and operating substantially as and for the purpose herein shown and described.

2d, The above, in combination with the treadle, E, when the same is made as set forth.

70,968.—TOOL SUPPORTER OR RACK.—Zenas M. Crane, Dalton, Mass.

I claim the combination of the bent lever, A, the adjustable tooth, e, and the jaw, g, applied to the plate, B, and arranged substantially as described.

I also claim the combination and arrangement of the projection, h, with the bent lever, A, the adjustable tooth, e, and the jaw, g, applied to the plate B, and arranged substantially as specified.

70,969.—MANUFACTURING BRICKS.—E. W. Crittenden, Pittsburg, Pa.

I claim, 1st, The fluted or corrugated rollers, B B' B'', a rotary screen, D, and endless carrier or apron, F, arranged substantially as and for the purpose set forth.

2d, The tempering or moistening of the pulverized clay by jets of low-pressure steam from a steam box, H, substantially as shown and described.

3d, The evener, G, the rotary screen, D, and endless carrier or apron F, arranged substantially as and for the purpose specified.

4th, The molds, N, in the wheel, L, in combination with the plungers, O, and the arms, Q, operated in the manner substantially as herein shown and described.

5th, The elevator, I, and endless carrier, V, when used in combination with a rotary mold wheel, substantially as and for the purpose specified.

70,970.—MILL GEARING.—Joshua C. Cunningham, Oglethorpe, Ga.

I claim the pinion wheels, C, each composed of two sets of cogs and of unequal diameters, in combination with the base, A, crown gear wheel, B, and shafts, F, all arranged and operating as described, for the purpose specified.

70,971.—LOAF-BREAD MACHINE.—John D'Arcy, San Francisco, Cal.

I claim the combination and arrangement of the kneading rollers, C C', endless apron, a, carried by the rollers, D and D', and the rotating knife, F, all as set forth.

70,972.—PLOW.—Jonathan R. Davis, McKay, Ohio.

I claim, 1st, Forming the beams, A B, standards, E, brace bars, G, and handles, H, and adjustably connecting them to each other, substantially in the form and manner herein shown and described and for the purpose set forth.

2d, The combination of the jointed or pivoted bars, C and I, with the beams, A and B, and handles, H, substantially in the manner herein shown and described and for the purpose set forth.

70,973.—BOTTLE WASHER.—Henry B. Davison, San Francisco, Cal.

I claim a bench or support provided with a series of holes, B B, to hold the bottles, in combination with a series of jet pipes, D D, extending into the nozzles of the bottles, and conducting water to wash them, substantially as described.

70,974.—TRUNDLING HOOP.—John G. De Coursey, Philadelphia, Pa.

I claim the hoop, A, with its hub, b, and spokes, a, in combination with an arm or handle, C, connected to the said hub, substantially as and for the purpose described.

70,975.—BOOT TREE.—Peter De Vries, Adrian, Mich.

I claim the combination of the front and foot, A B, made in one piece, the back, C, the spreading key, K, the lever, I, elastic plate, l, vertical screw, G, and horizontal screw, H, all arranged and employed in the manner and for the purposes set forth.

70,976.—HARVESTER RAKE.—Wm. P. Dillman, Joliet, Ill.

I claim, 1st, The arrester, c, attached to the outer grain guard of the platform, and inclined toward the inner end of said platform.

2d, A grain arrester so constructed that the revolving rake passes under its outer end.

3d, The arrester, c, constructed as described, in combination with the rake b, or its equivalent.

70,977.—CENTER BOARD.—Felix Dominy, Penataquit, N. Y.

I claim the center board, A, constructed as described, when provided at its forward upper end with the sliding bar, E, by which it is raised or lowered, substantially as herein shown and described.

70,978.—ROCK-DRILLING MACHINE.—George Downing (assignor to himself and Robert Hermance), Schuylerville, N. Y.

I claim, 1st, The crank wheels, I, in combination with the shaft, H, double cams, G, drill spindle, B, sliding plate, C, and upright part, D, as herein set forth, for the purpose specified.

2d, The combination and arrangement of the lever, N, spring, B', arm, L, pawls, K and C', and ratchet wheel, J, with each other and with the drill spindle, B, with its drill point, A, sliding plate, C, and crank wheel, I, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the shaft, O, toothed wheels, P, pawls, S and V, arm, T, and racks, R, with each other and with the sliding plate, C, and upright part, D, of the frame of the machine, substantially as herein shown and described and for the purpose set forth.

4th, The upright part, D, of the frame, connected to the horizontal part by means of the hinges, X, and adjustable hooks, v, substantially as herein shown and described and for the purpose set forth.

70,979.—AUTOMATIC VENTILATING STOVE.—Richard Eaton, London, Eng.

I claim, 1st, The combination with a ventilating stove of an automatic apparatus for operating the direct draft register or damper, and the ventilator damper, so as to transfer the draft from the one to the other, and regulate the same, substantially as and for the purpose set forth.

2d, The combination with the ventilating stove, A B D E F, of the damper or register, C, damper, G, rod, L, lever, I, and connections, I J K, or their equivalents, arranged and operating substantially as and for the purpose described.

3d, The weight, M, applied and operating in connection with an automatic ventilating stove, substantially as and for the purpose specified.

70,980.—RUNNING GEAR FOR VEHICLES.—Solomon J. Edwards, New Berlin, N. Y.

I claim in combination with sleeve, C, and set screws, d d, arms, B B, boxes g g, and rollers, e e, when all are constructed and arranged as and for the purpose set forth.

70,981.—LOCK FOR TRAVELING BAGS.—Hermann Fautz (assignor to himself and Joseph H. Ferreira), Newark, N. J.

I claim the levers, A A, or their equivalents, in combination with the springs, c c, catches, E E, and knob, G, substantially as specified and for the purpose named.

70,982.—SAFETY ATTACHMENT FOR POCKETBOOKS.—Wm. H. Ferguson (assignor to himself and Clark D. Page), Rochester, N. Y.

I claim, 1st, The combination and arrangement with the parts, A B c, of the fastening, of the spring, E, provided with the reverse bends, f h, forming respectively the finger rest and the eye, the whole operating in the manner and for the purpose specified,

2d, As a new article of manufacture, the fastening for pocket books consisting of the plates, A B, provided with the points, a a, and attached to the leather disk, b, the whole arranged as described, and operating in the manner and for the purpose herein set forth.

70,983.—PEAT AND BRICK MACHINE.—George B. Fisher, Chicago, Ill.

I claim in combination with a cylinder provided with a series of molds and plungers, operating as described, the arrangement of a chain of blocks, D, for covering said molds, substantially as specified and described.

70,984.—MEAT SPIT.—Paul Fisher, Williamsburg, N. Y.

I claim the skewer plates, B, provided with the skewer, C or D, in combination with the body, A, of the spit, substantially as described for the purpose specified.

70,985.—ROTARY SWING.—I. N. Forrester, Bridgeport, Conn.

I claim, 1st, Rotating a swing or swings at once around horizontal and vertical axles, substantially as herein shown and described.

2d, The revolving platform, C, arranged around the post, B, and provided with uprights, D D, in combination with the swing frames, E, and their axles, b, all made as set forth.

70,986.—BOTTLE STOPPER.—Howard B. Fox, Oxton, and James T. Hall, Liverpool, Eng.

We claim, 1st, A stopper formed or wood and cork in combination, forming a cheap and durable stopper, substantially as and for the purposes herein set forth.

2d, The within described construction and arrangement of the rigid parts, a1 a2 a3, having three different diameter, and fitted within and upon the elastic part, b, in the manner and for the purpose herein set forth.

70,987.—MACHINE FOR PICKING HAIR.—Franklin Frey, Liberty, Ill.

I claim the cylinders, D D', and adjustable floor, G, suspended in the rod, c and having concave surfaces corresponding to the cylinders, provided like them with teeth, e e', in combination with the box, A, and feed table, H, the whole being arranged to operate as and for the purpose described.

70,988.—BREAST PUMP.—Wm. T. Fry, New York city.

I claim, 1st, The tube, d, flexible at its outer end, in combination with a receiving vessel, A, and with a vessel, D, or equivalent device, for exhausting the air from the vessel, A, substantially as and for the purpose described.

2d, The valve case, B, consisting of detachable caps, m n, with their openings, e i i, and the vibrating disk, s, the whole being constructed and arranged substantially as specified.

70,989.—BEEHIVE.—Jacob Gatschet, York Township, Ohio.

I claim, 1st, The case, A, when constructed and put together in the manner and for the purpose set forth.

2d, The inclined plane, B, in combination with the frames or sash, g g g, when said sash are constructed as and for the purpose described.

3d, The cap piece, C, in combination with sash, D D, as and for the purpose specified.

4th, Inclined plane, B, sash, g g D D, cap piece, e, and glass frame, k and B, all arranged as and for the purpose set forth.

70,990.—MANUFACTURE OF WHITE LEAD.—Isaac M. Gattman, New York city.

I claim, 1st, Subjecting a strong and hot solution of the basic acetate of lead to a current of carbonic acid gas, substantially as and for the purpose herein described.

2d, Applying steam in connection with a current of carbonic acid gas to a strong and hot solution of basic acetate of lead, substantially as and for the purpose specified.

3d, Correcting defective precipitate of neutral carbonate of lead formed by the current of carbonic acid gas when the solution of basic acetate of lead may be too weak, by boiling it in a stronger solution of basic acetate of lead, as herein set forth.

4th, The manufacture of pure amorphous white lead by the method substantially as herein described.

70,991.—VIOLINS AND OTHER BOW INSTRUMENTS.—George Gemünder, New York city

I claim, 1st, Arranging an additional sound post, D, within the case of a bow instrument, substantially as and for the purpose herein shown and described.

2d, Combining the additional sound post, D, with a string, E, which passes over it, substantially as and for the purpose herein shown and described.

3d, Connecting the sound posts of a bow instrument by means of a string, E, and the tail piece, F, with the main strings of the instrument, substantially as herein shown and described.

4th, The bridge, C, for connecting the post, D, with the main sound post, B, substantially as and for the purpose herein shown and described.

70,992.—BOOT HEEL CUTTER.—Benj. F. Goddard, Charlton Depot, Mass.

I claim, 1st, A device for cutting boot and shoe heels, composed of a plurality of dies of different sizes, arranged to operate in the manner substantially as shown and described.

2d, The rising and falling die, D, and rod, E, arranged to operate in connection with the die, C, substantially as and for the purpose ses forth.

70,993.—CHIMNEY COWL.—B. J. Goodsell, Pent Water, Mich.

I claim, 1st, The combination of two polygonal slotted caps, G and H, or of a single cap having double side walls, with the top of the chimney, said cap or caps being constructed and arranged substantially as herein shown and described and for the purpose set forth.

2d, The combination of the interior pipe or flue, C, and exterior ventilating pipe, D, with each other, with the chimney, B, and with the polygonal slotted cap or caps, G H, substantially as herein shown and described and for the purpose set forth.

70,994.—ICE CUTTING MACHINE.—Wm. F. Gordon, Detroit, Mich.

I claim the combination and arrangement of the runner, A, the traction wheels, B, the gear wheels, C D, pinions, E F, the ratchets, H H, the shafts, K L M N, the circular saw, O, the skate rudder, P, the slipping collar, S, the guide lever, T, the seat, V, the shafts, W, the frames, X X, and 4, 4, the driving wheel, Y, belt, 2, pulley, 3, and the marking rod, 7, all arranged substantially as described and for the purpose designed.

70,995.—FURNACES FOR ROASTING ORES.—Henry Goulding Silver City, Nevada.

I claim, 1st, The roasting of ores in molds or chambers, substantially as described.

2d, The arrangement of molds containing ores to be roasted, so that they can be gradually brought nearer the fire or removed from it, substantially as described.

3d, Removing the molds containing ores from the fire while undergoing the process, so that the decomposition may be conducted without additional heat, substantially as described.

4th, The placing of a freshly filled mold containing unroasted ore upon the top of a mold that has been removed from the fire, for the purpose of utilizing the excess of heat, substantially as described.

5th, The arrangement of furnace, cooler, and crane, as described, for the purpose described.

6th, The conducting of the flue through water, or its equivalent, for the purpose of condensing the volatile matter, when used in connection with ores roasted in molds, substantially as described.

70,996.—APPARATUS FOR MOLDING COLLARS.—Solomon S. Gray, Boston, Mass.

I claim a combined gage and mold or former for placing and shaping paper collars, constructed and operating, substantially as described.

70,997.—DIE FOR SWAGING HAMMERS.—Henry Hammond, Hartford, Conn.

I claim the peculiar manner of constructing hammers herein set forth, by means of dies and punches of the form described.

70,998.—DIE FOR FOMING THE CLAWS OF HAMMERS.—Henry Hammond, Hartford, Conn.

I claim, 1st, The combination of the dies, a and b, and cutter, c, all constructed and arranged substantially as described.

2d, In combination with the dies, a and b, and cutter, c, I claim the cam, K, arranged and operating substantially as described.

70,999.—CONCRETE BRICK MACHINE.—Mortimer S. Harsha, Batavia, Ill., assignor to himself and Laviss F. Dow, Cortland, N. Y.

I claim, 1st, The combination of the mold composed of the slides, D C, and the bottom, X, the plunger, E, and the jointed lever, I, all arranged substantially in the manner and for the purposes set forth.

2d, The combination of the mold constructed of the bottom, X, and the slides, C and D, with the jointed arm, I, shaft, M, cord, r, and spring, L, or its equivalent, arranged and operating as and for the purposes specified.

3d, The combination of the mold, slides, D and C, spring, N, plunger, E, and lever, F, arranged and operating as and for the purposes set forth.

71,000.—STRAW CUTTER.—Jas. T. Harvey, Murrysville, Pa.

I claim the double edged knife, d, attached by a sash or otherwise to the inclined guide rods, i i, in combination with the metallic plates or edges, c c', and bifurcated ratchet bar, m, with adjustable arms, n n', constructed and operated substantially as and for the purposes above set forth.

71,001.—FEEDER FOR CARDING MACHINES.—George S. Harwood, Woonsocket, R. I.

I claim, 1st, In a card feeding machine such as described, the plate for carrying the traversing rolls, constructed as herein specified, that is to say, countersunk, or provided with recesses, so as to form a cap or covering for the said rolls, substantially as and for the purposes set forth.

2d, The guide or ring attached to the traverse plate, provided with a lip or guard, extending between and partly around the rollers, as and for the purposes specified.

71,002.—GAS HEATING APPARATUS.—David Greene, Haskins, Cambridge, Mass.

I claim, 1st, The combination of an air chamber, A, constructed as described, with the ring, r, the perforated tube, B, and the air supplying apparatus, S S S, or its equivalent, substantially as and for the purpose described.

2d, I claim the combination of the chamber, A, and the tube, D, provided with deflectors, and a plate or button, o, with a gas or vapor burner, substantially as and for the purpose specified.

71,003.—SHANK SPRINGS FOR BOOTS AND SHOES.—Edward Heaton, New Haven Conn.

I claim as a new article of manufacture the herein described shank spring consisting of a wood spring, A, combined with a tempered metallic spring B, united in the manner substantially as set forth.

71,004.—METHOD OF DRYING GUNPOWDER.—E. E. Hendrick, Carbondale, Pa.

I claim the dessication of gunpowder by submitting the same in vacuo to a removal of the atmospheric pressure, for the purpose and in the manner substantially as described.

71,005.—LIGHTING GAS BY ELECTRICITY.—John M. Higgins (W. B. Culbertson, administrator), St. Louis, Mo.

I claim, 1st, The switch, S, vibrated by the rotation of the wheel on the gas cock, substantially as described.

2d, The combination of the wheel, D, with cams, d d, and the vibrating switch, S, as described.

3d, The arrangement of the clock gearing, the fan, K, the wheel, D, the escapement, L l l', and the notched wheel, Q, substantially as described.

4th, The armature, O, spring catch, o, and escapement, L l l', arranged substandially as described.

The arrangement of the spring, E, and gearing, the fan, K, cam-faced wheel, D, armature, O, escapement, L, and switch, S, substantially as described and represented.

71,006.—FIBROUS MATERIAL.—Theophilus Higginbotham, Hernando, Fla. assignor to himself, John Parsons and Eberhard Faber, New York city.

I claim producing from the plant known as the *althea frutex*, or cocklebur, fibres fit for ropes, textile fabrics, or paper, substantially as set forth.

71,007.—AIR CHAMBERS OF PUMPS.—Richard H. Hilton (assignor to Mitchell, Allen & Co.), Newbern, N. C.

I claim the tube, B, the strainer, B', ball valve, C, conical valve-seat, D, and the sediment chamber, F, arranged substantially as described, in combination with the air chamber, A, for the purpose set forth.

71,008.—SHAFT COUPLING.—George P. Hodson and James L. Hodson, Philadelphia, Pa.

We claim the within described coupling, composed of the outer portion, A, with its internal inclined ribs, h, and the inner severed portion, B, with its inclined ribbs, f f; the two portions being adapted to each other and to the shaft, and secured together, all substantially as and for the purpose herein set forth.

71,009.—WINDOW BLIND FASTENER.—Edward A. Holbrook, John E. Dodge and G. H. Marshall, Watertown, N. Y.

We claim the combination, with a hinge constructed as described, of the sliding shaft, and pinion, and locking stud, under the arrangement herein described, so that the said pinion may be locked, and its motion prevented, while it remains in gear with the crown wheel or circular rack of the said hinge.

71,010.—PANTOGRAPHIC ENGRAVER.—John Hope (assignor to Hope and Company), Providence, R. I.

I claim, 1st, Combining the carriage of the tracer, or stylus, in a pantographic engraving machine with the object table, by means of the levers, L and O, and the stud pins, h and l, operated respectively by the levers, K and N, through the rocking standards, K' and N', substantially as described for the purposes set forth.

2d, Making the index-plate, S, adjustable with reference to the surface of the roller, to be engraved by the means substantially as described.

71,011.—AMALGAMATOR.—Alfred Horn, Silver City, Nevada.

I claim, 1st, The application of a scraper or distributor, C, to an amalgamating machine or pan, for the purpose of distributing the mercury through the pulp, substantially as described.

2d, Arranging the said distributor to an amalgamating machine, so that it may be easily adjusted to the wear of shoes and dies, substantially as described.

71,012.—BOLT MACHINE.—Wm. W. Hubbard, Philadelphia, Pa.

I claim, 1st, The two hammers, F and F', one having a head and anvil for forging, and the other a head and anvil for heading bolts, in combination with a double cranked shaft for operating the hammer, substantially in the manner set forth.

2d, The connecting rods, D and D', each composed of two parts, with intervening spiral springs, all constructed substantially as and for the purpose described.

3d, The combination of plate, a, having the L-shaped slots, e, of the crank rods, with the pins, d, of the vibrating arms, E and E'.

4th, The spring levers, J and J', spindles, s and s', notched arms, v', springs, q', and the rods and chains herein described, in combination with the connecting rods, D and D', and vibrating arms, E and E', for the purpose specified.

5th, The lever, I, and shaft, p, with its arms, n' and p', in combination with the hinged block, or anvil, H, its rod, l', and the weighted chain, m.

71,013.—ICE PITCHER.—G. W. Hull, Wallingford, Conn.

I claim, 1st, An ice pitcher, or cooler, in which the bottom is corrugated, substantially in the manner and for the purpose set forth.

2d, The screw cap, a, combined with a pitcher or cooler, constructed in the manner herein described, and as and for the purpose specified.

71,014.—SPRING BED BOTTOM.—Heman L. Huntington, Chicago, Ill.

I claim, 1st, The combination of the frames, A B, springs, S, metallic strips, D, V-shaped springs, E, arranged as and for the purposes specified.

2d, The combination of the frames, A B, springs, S, strips, D, and straps and buckles, F G, substantially as and for the purposes specified.

3d, The combination of the frames, A B, springs, S, V-shaped springs, E, and straps and buckles, F G, as and for the purposes described.

71,015.—GOVERNOR FOR STEAM ENGINE.—Reuben K. Huntoon (assignor to himself and J. Augustus Lynch), Boston, Mass.

I claim the combination and arrangement of the close oil vessel, I, and the open head or partition, H, with the case, A, the propeller, its shaft, and driving gears, arranged within the vessel and case, substantially as described.

I also claim the combination as well as the arrangement of the arm, M, its shaft, N, wheel, U, chain, V, and weight, W, or the mechanical equivalent of such wheel, chain and weight, with the propeller, its shaft, and the case or cases containing such propeller and shaft.

I also claim the combination of the guide wheels, X X, or their equivalent, with the weight, W, its chain, V, and supporting wheel, U, the shaft, N, arm, M, the propellor, its shaft, oil reservoir or case, and operate mechanism, substantially as described.

I also claim the combination of the insulator, E, with the steam-valve case, and the governor made and applied thereto, substantially as set forth.

71,016.—VALVE FOR STEAM ENGINE.—Archibald Hutton, St. Louis, Mo.

I claim the valve, A, when constructed with one or two port-openings, a3, and combined with the ports, a a1, a2, and the condenser passage, B, as described and set forth.

71,017.—SASH STOP.—Charles R. Jenkins, Philadelphia, Pa.

I claim the combination with a window sash of a set of metallic or inelastic rollers, D, applied to one side, and a set of soft rubber rollers, C, applied to the other side, as and for the purpose set forth.

71,018.—SASH SUPPORTER.—Charles Kane (assignor to himself and John Gribben), Alleghany City, Pa.

I claim the polygonal shaped elastic friction roller, C, in combination with the box, H, slots, G G, and screws, F F, arranged in the manner and for the purpose specified.

71,019.—ESCAPEMENT FOR TIME-PIECES.—Wm. C. Kellum, San Francisco, Cal.

I claim in combination with the escape wheel, O, the arrangement of the detent lever, H, springs, J and K, lock lever, n, and adjusting screw, I, substantially as and for the purpose set forth.

71,020.—SLITTING MACHINE.—John J. Kents, Newtown, Pa.

I claim the combination of a series of knives or cutters with a segmental hinged press frame, covered with leather, a bearing plate, stationery and movable guides, distance pieces and screw, when combined and arranged in the manner and for the purpose described and set forth.

71,021.—CAR WHEEL.—Chas. E. Kleinschmidt, Cleveland, O.

I claim the plates, B B, having flanges, c c2, on their outer and inner edges, the hub, b, having a bevelled periphery, the tire, D, having its inner surface also bevelled, and the rings, E E2, and the bolts, f f, all constructed, arranged and combined in the manner described and for the purpose set forth.

71,022.—TOILET TABLE.—F. Kopper, New York city.

I claim the combination of the hinged parts, B, bars, D, hinged legs, C, spring catch, E, and adjustable towel frame, F, constructed and adapted to be folded together, as herein set forth for the purpose specified.

71,023.—GRAIN BINDER.—Israel Lancaster, Baltimore, Md.

I claim, 1st, The combined action of the band carrier, 50, an l wing, C, substantially as described, and for the purpose mentioned.

2d, The application to the band carrier, 50, to the chain, O, constructed and operated substantially as described and for the purpose mentioned.

3d, The method of holding the two ends of the cord forming the sheaf-band, by means of pinching bars placed at a short distance from each other, between which bars the knot is formed, substantially as described.

4th, The plate 16, and the pinching bar mechanism operated by it, constructed and operating substantially as described and for the purpose mentioned.

5th, The adjusting lever, B, and slotted plate, w, acting in combination, constructed substantially as described, and for the purpose mentioned.

6th, The removing of friction from the spools, E, during the rapid movements of the lever, B, substantially as described, and to prevent breakage of the band material.

7th, The operation of the bar, 20, by cam segments on the shaft, 22, in the manner and for the purpose substantially as described.

8th, The construction and operation of the knife, 7 7", in the manner and for the purpose substantially as described.

9th, Preventing slack in the sheaf band on releasing the sheaf, by forming the folds of the knot over an arm which carries it to a straight line between the pinching bars, in the manner substantially as described.

71,024.—TASSEL FASTENING.—Charles P. Lang, Chicopee, Mass.

I claim, 1st, The cam fastening, a, when constructed as described, and for the purpose specified.

2d, The cam, a, in combination with the core-block, c, and cord, b, substantially as and for the purpose specified.

71,025.—SLEIGH KNEE.—Gunder Larson, Lake Mills, Wis.

I claim a cast iron sled knee, having separate supports, in one casting, as shown and described, and for the purpose specified.

71,026.—HOSE GUARD.—David P. Lewis, Huntsville, Ala.

I claim a guard for hose or tubing, made substantially as described, for the purpose specified.

71,027.—PAINTERS' WINDOW-JACK.—S. P. Loomis, Philadelphia, Pa.

I claim the improved window jack, constructed and arranged substantially as and for the purpose herein shown and described.

71,028.—APPARATUS FOR CHARGING SODA WATER.—John D. Lynde, Philadelphia, Pa.

I claim, 1st, Constructing the acid-chamber, K, in such form that when combined with the body of the generator, and charged for use, and tilted back, the acid in the chamber will recede or flow back from the valve, substantially as set forth.

2d, Supplying strainers to the inside of acid chambers or gas generators for the purpose described.

3d, The application of enamel or porcelain lining to the alkali chamber or body of gas generators.

4th, The application of the rockers, F2, to gas generators, as described.

5th, Tilting gas generator for the purpose set forth.

6th, Providing gas generators, or fountains, constructed of cast iron, with the braces, o o, to strengthen the flange, substantially as described.

71,029.—CHURN.—Romualdus Mahr, New York city.

I claim the arrangement of the driving wheel, H, pulleys, L and M, belt, g, double crank shaft, K, connecting rods, f f, and sleeve rods, E E, for working the reciprocating dashers, the whole constructed and operating substantially as described and specified.

71,030.—FIRE ESCAPE.—John Marx, Rochester, N. Y.

I claim the arrangement with the flexible tube, A, of the cord, a, sharp-pointed hooks, c, and the flap, B, operating in the manner and for the purpose herein set forth.

71,031.—WINDOW BLIND FASTENING.—Benson Mayo, Chatham, Mass.

I claim the combination of the spur, a, the latch springs, b b', the guard, c, the bracket rest, d, and the window blind, A, arranged and operating substantially as and for the purpose herein described.

71,032.—CONSTRUCTION OF SHEET METAL COAL HODS.—John McCoy (assignor to himself and Wm. T. Snell), Philadelphia, Pa.

I claim manufacturing sheet metal coal hods, by making the foot, C D, and the upper part, A, of the body, of plain sheet iron, and the bottom, E, and the lower part, B, of the body, of galvanized or zinced sheet iron, substantially as and for the purpose described.

71,033.—HOOP SKIRT.—John McKeever, New York city.

I claim a woven skirt, a portion of which is made of single close texture, and a portion of open guaze net work, the pockets being made of double close texture, as a new article of manufacture.

71,034.—FLOOR CLOTH AND CARPETING.—John B. Meldrum, Paterson, N. J.

I claim a jute floor cloth, or carpet printed with aniline colors, substantially as and for the purpose described.

71,035.—HAND LOOM.—A. Meredith and P. P. Meredith, Maxintuckee, Ind.

We claim the cam plate, I, in combination with the three-pronged dog, b, the levers, h h, the springs, m m, and the shuttle-drivers, L L, constructed, arranged and operating substantially in the manner and for the purpose herein shown and described.

71,036.—APPARATUS FOR DYEING HAIR.—Charles Merritt, South Weymouth, Mass.

I claim as my invention the apparatus substantially as described, that is, as composed of the jointed curved levers, and the cone, sponge, and jaw, arranged together substantially as set forth.

71,037.—BRUSH HOLDER.—John Messinger, Springfield, Vt.

I claim, 1st, The socket, C, in which the handle, D, is fitted, when secured to the clamp of a scrub brush, as shown, or in an equivalent way, to admit of the socket or handle being adjusted in different positions relatively with the brush, as herein set forth.

2d, The combination of the clamp, A, and socket, C, constructed substantially in the manner as and for the purpose specified.

71,038.—ELASTIC GUSSETS FOR WEARING APPAREL.—James Miller and James Miller, Jr., Peckham, Eng.

We claim elastic gussets or springs, formed by stitching through two fabrics several rows in parallel lines, and inserting between the same India rubber thread or cord, in one continuous length, substantially as herein described and for the purposes specified.

71,039.—KNITTING MACHINE NEEDLE.—Job Miller, Warren, R. I.

I claim a knitting machine needle, constructed of sheet metal, and formed as described, in combination with a stitch caster, constructed as described, to fit said needle, as and for the purpose set forth.

71,040.—DRAIN TILE MACHINE.—James W. Milroy, Galveston, Ind.

I claim the construction of a machine for molding tiles for drains by means of a table and treadles, d d, operating the roller, C, through slides, b b, working in grooved standards, a a, and the combination of the mold, E, with the roller in a machine as thus constructed, substantially in the manner and for the purpose as herein set forth.

91,041.—SPRING BUCKLE.—J. Ferguson Morsell, Stamford, Conn.

I claim, 1st, The combination of the bed plate, A, and spring, C, carrying a ridge or jaw, D, substantially as and for the purpose herein specified.

2d, The combination of a loop, E, with the bed plate, A, and spring, C D substantially as and for the purpose herein specified.

71,042.—MACHINE FOR MAKING BALL-CHAIN.—D. T. Munger, Waterbury, Conn.

I claim, 1st, The die E, combined with the dies, F F, so as to operate to close the ball upon the rivets, substantially as herein set forth.

2d, The arrangement of the plate, I, in combination with the dies, E and F F, as and for the purpose specified.

71,043.—HOISTING MACHINE.—Wm. Murray, Chicago, Ill.

I claim, 1st, The combination of the shaft, I, the disk, K, and bar, J, in a hoisting machine, when arranged and operating substantially as and for the purpose set forth.

2d, The combination of the platform, A, provided with the blocks, M, and frame, B, when constructed and operated substantially as described.

3d, In combination with the above, the pieces, N, for the purpose of keeping the platform horizontal, substantially as specified.

4th, I claim in combination with the platform, A, and racks, Q, the plates, O, rods, R, and levers, S, when arranged and operating substantially as and for the purposes herein set forth and described.

71,044.—COMBINED PUMP AND RESERVOIR.—Enoch Nickerson, Provincetown, Mass.

I claim a tank or reservoir, A, made air tight at its sides and top, and provided with a perforated bottom, in combination with a pump, D, as and for the purpose specified.

71,045.—FOLDING CHAIR.—J. Nicolai, Boston, Mass.

I claim the combination of the legs, A and B, pivoted at H, the handles, D, and C', the seat hinged at the rear end, and supported in front upon the rung, M, substantially as described and for the purpose set forth.

71,046.—LEVER FOR RAILROAD CARS.—Jay Noble, Rochester, N. Y.

I claim the lever, 1, jack 2, and fulcra, 3 and 4, constructed and arranged as and for the purposes mentioned and set forth.

71,047.—SHOW STAND.—John G. Oonk, Owensville, Ohio.

I claim a show stand constructed substantially as and for the purpose described.

71,048.—MACHINE FOR CUTTING PASTEBOARD, ETC.—Samuel Orth, Philadelphia, Pa.

I claim the shafts, D and E, with their adjustable disks, m and n, in combination with the shaft, F, and its adjustable disks, q, and the roller, D, the whole being constructed and arranged for the simultaneous cutting and scoring of straw and other boards substantially as set forth.

71,049.—STAIRS.—Wm. W. Page, Troy, N. Y.

I claim the combination of two or more parallel flights or sections in one staircase, or ascent of steps, assigning a separate flight to each foot, substantially in the manner and for the purposes set forth.

71,050.—APPARATUS FOR RAISING FLUIDS.—James Parker, Camberwell, Great Britain, assignor to W. W. W. Wood and R. H. Lamsen.

I claim the combination of the steam pipe, A, and its perforations, and the pipe, B, and its nozzles, b, with the tanks, C, their valves, D, or their equivalents, and pipe, E, for the purpose specified.

71,051.—LABEL HOLDER FOR RAILROAD CAR.—John H. Parsons, Quincy, Mich.

I claim the arrangement of the label rack, B, lid, A, with the coil spring, m z, substantially as and for the purpose described and set forth.

71,052.—BELT TIGHTENER.—Marquis Peatt, Dexter, Mich.

I claim the convex half-clasp, B, and the concave half-clasp, A, and the buckle, E, in conjunction with the strap, I, and the winch, G, arranged as and for the purposes described.

71,053.—GANG PLOW.—Horace L. Perry, Aurora, N. Y.

I claim, 1st, In a gang plow having a main frame, A, and a plow frame, C, substantially as herein described, hinging the main frame, A, at one side up on the axle, so that it may be levelled in the manner and for the purpose set forth.

2d, The rib or flange, O, formed upon the supporting wheels, substantially as and for purpose set forth.

71,054.—BRAKE FOR VEHICLES.—Cyrus Phelon, West Granville, Mass.

I claim a brake for vehicles in which the brake bar, B, having the shoes, H, arranged behind the wheels upon the body of the vehicle, is connected with the lower end of a lever, A, pivoted through the pole, the other end of said lever being operated by the holding back of the animals, the whole being arranged substantially as shown.

71,055.—QUARTZ MILL.—Loring Pickering and Chauncey St. John, New York city.

We claim, 1st, In a quartz mill the pan, A, having an annular trough, the mullers, B, propelled by arms, C, having fans, 3, and agitators, F, constructed and operating substantially as described.

2d, The jacket, D, and cone, J, when arranged with the cylinder, E, and used in combination with the parts of the above-described quartz mill, substantially in the manner and for the purpose specified.

71,056.—ROCK-DRILLING MACHINE.—Walter Pierce, Onion Valley, Cal.

I claim, 1st, The adjustable ways, C, having the drill, D, and the slotted hammer, F, moving upon them, substantially as and for the purpose described.

2d, The levers, J I and G, operating upon each other and upon the hammer, F, substantially as and for the purpose described.

3d, In connection, as an improved drilling machine, the levers, J I and G, the hammer, F, operating upon the drill, D, together with the adjustable ways, C C, the whole constructed substantially as and for the purposes herein described.

71,057.—ROLLER WHEEL FOR PLOWS.—Leman B. Pitcher, Salina, N. Y.

I claim, 1st, The segment frames, B B, and the cups, C C, when applied to a roller wheel for plows and cultivators, each separately and in combination with each other, substantially as and for the purposes described.

2d, I also claim the same parts, in combination with the roller wheel, A, operated upon the shafts, a a, substantially as and for the purposes described.

71,058.—APPARATUS FOR PRINTING TIN FOIL.—John Polhemus, Jersey City, N. J., and Christian H. Lilienthal (assignors to C. H. Lilienthal), Yonkers, N. Y.

We claim, 1st, In combination with a continuous sheet of tin foil and shell, J, the intermittent shear cutter, P, or equivalent therefor, operating as herein before set forth, and for the purposes described.

2d, We also claim, in a printing press for printing on a continuous sheet of tin foil, the combination of the intermittent shear cutter with the series of rollers, U, and bands, T, for the purposes hereinbefore set forth.

71,059.—HORSE BLOCK AND HITCHING POST.—Geo. W. Preston, Corning, N. Y.

I claim, 1st, The combined horse block and hitching post, substantially as above set forth and described.

2d, The said combined horse block and hitching post, in combination with the hand rail, C, substantially as described.

3d, The said combined horse block and hitching post, in combination with the scraper, E, substantially as described.

71,060.—BELLOWS.—C. W. English, Cincinnati, Ohio.

I claim a bellows having a pipe with a tapering or flaring butt, B1 and shoulder or collar, B2, applied and operating in the manner and for the purpose set forth.

71,061.—CHILDREN'S CARRIAGE.—Horace H. Prindle and John W. Prindle, Sandusky, Ohio.

We claim, 1st, Attaching the body of the carriage to the running gear by means of joints, one of which is adjustable, and so applied that the carriage can be converted into a cradle, substantially as described.

2d, The combination of the spring, f, or its equivalent, with an adjustable joint, a', and front joint, i, substantially as and for the purposes described.

71,062.—SHAPING DIES OF GROOVED ROLLS.—Abraham Reese, Pittsburgh, Pa.

I claim the die, formed by the face of the roll, a, the collar, l, and the spring collar, d, substantially as and for the purposes hereinbefore described.

71,063.—RAILWAY CHAIR AND SLEEPER.—Leonard Repsher, Camden, N. J.

I claim, 1st, The combined sleeper and chair, consisting of the coupling bar, B, and clamps, D D, the whole being constructed and arranged substantially as and for the purpose herein set forth.

2d, The recesses, l, in the coupling bar, B, for the purpose set forth.

71,064.—NAIL-PLATE HOLDER.—J. C. Rhodes, South Abington, Mass.

I claim for employment, in a nail or tack machine, the combination of plate holder and nose piece, when constructed and arranged to operate substantially as described.

71,065.—CHURN DASHER.—R. W. Robinson, Clinton, Ill.

I claim a churn dasher having floats, with the planes of their blades set parallel with the axis of the spindle, A, and obliquely to the planes of a radius passing through their axes and through the axis of the spindle, substantially as and for the purpose set forth.

71,066.—THILL COUPLING.—Silas Rogers, Stanfordville, N. Y.

I claim the thill coupling, constructed as described, consisting of the upward projecting hook, C, formed upon the clip, and the eye, E, upon the thill iron, D, fitting over said hook, when the outer side of said eye is provided with the packing, F, working against the outer side of the hook, as herein described for the purpose specified.

71,067.—CHAIR BOTTOM.—C. W. Royse, Peterborough, N. H.

I claim fastening or securing the overlapping ends of the strips of the net work of chair bottoms passed over and under the frame, by means of staples, as above set forth and described.

71,068.—BRANDING IRON.—Chas. Rundquist, Mankato, Minn.

I claim, 1st, The combination of the types having tapering shanks, I, and plates, H, the pins, J, side bars, E, end pieces, F, set screw, M, blocks, L, arms, C, and handle, B, all constructed as described, for the purpose specified.

2d, The types, constructed as described, provided with the back plates, H, and tapering shanks, I, secured in the holder by means of the transvers pins, J, and blocks, L, the latter secured in position between the types by means of the central curved arms, C, as herein shown and described.

71,069.—FRUIT SEEDER.—S. A. Russell, Huntington, Conn.

I claim the arrangement of a cutter, E, having its edge formed in the manner substantially as described, with the follower, a, and combined with the seat, D, so as to operate in the manner set forth.

71,070.—CORN PLANTER.—J. M. Sampson, Waynesville, Ill.

I claim the plungers, E, fitted in openings, e, in the posts or standards, D D, and provided with cells or openings, f, in combination with the openings, e, in the posts or standards, and the elastic plates, i, all arranged to operate in connection with the hoppers, K K, and coverers O, substantially in the manner as and for the purpose set forth.

71,071.—PRESS.—Ulrich Schegg, Nauvoo, Ill.

I claim, 1st, The combination and arrangement of the levers, F, the ratchets, E', and the weights, w, substantially in the manner and for the purpose set forth.

2d, The combination of the roller, E, the ratchets, E', and the tackle, H h, substantially in the manner and for the purpose set forth.

3d, The combination and arrangement of the follower, D, the cords, I, and the roller, I', substantially as described and set forth.

71,072.—ALLOY TO IMITATE SILVER.—Achille Schmitte and Hilaire André Levallois, Paris, France.

We claim, 1st, The new alloy, so called mock silver (minargent), composed of different metals, as described.

2d, Introducing in our so-called mock silver unalloyed tungsten, unalloyed aluminum, and a considerable proportion of nickel, the anti-affinity of which for aluminum is well known, and which we have made alloyable.

3d, And we claim not only the abovementioned typic proportions, but also any proportions which will answer the purposes.

71,073.—BURGLAR ALARM.—D. B. Skelly, Lockport N. Y.

I claim, 1st, The combination of the bell spring, C, the plate, E, the hook, r, and the pin, a, the springs, G and H, the hook, F, and the trigger, J, arranged and operating substantially as shown and described for the purposes set forth.

2d, The combination of the stud, O, the arm, P, the hook, P', and the hammer, N, arranged substantially as described for the purpose specified.

3d, The stud, L, in combination with the lamp, D, and plate, E, substantially as and for the purpose set forth.

4th, The combination of the springs, G and H, and the trigger, J, as and for the purposes described.

71,074.—MACHINE FOR CUTTING PAPER COLLARS.—David M. Smyth, Orange, N. J., assignor to O. P. Dorman, New York city.

I claim the combination of the two pairs of hinged shears for shaping the ends of paper collars, with the pair of shears for cutting off the collars from a strip or sheet of paper, and the feeding mechanism, or the equivalent thereof, substantially as described.

And I also claim the toothed wheel with its holding pawl, and connected with the sliding reciprocating frame by a spring arm, or equivalent, in combination with the holding clamp, substantially as and for the purpose described.

71,075.—BULLET MACHINE.—W. Spillman, Marion Station, Miss.

I claim, 1st, The combination and arrangement of the forming roller, C, the stationary die, D, and the eccentric, F, constructed and operating substantially as and for the purpose herein described.

2d, The shear knife, b, operated by the eccentric, F, combined with the catch, d, operated by the tappet, e, and the spring, g, as and for the purpose specified.

3d, The forming roller, C', combined with the rollers, G G', the bent lever, H, the cam, I, and the spring, a, constructed and operating substantially as and for the purpose set forth.

71,076.—ADJUSTABLE DIE FOR CUTTING PAPER COLLARS and other articles.—Charles Spofford (assignor to himself and Sam'l T. Lamb) Boston, Mass.

I claim the within-described adjustable die, constructed substantially as and for the purpose set forth.

71,077.—DAMPER.—J. F. Stafford, North Granville, N. Y.

I claim the damper, B, suspended upon a pivot, a, and weighted at E so as to assume a vertical position by gravity, and employed in connection with the elevating and sustaining apparatus, D F G H I J, as and for the purpose set forth.

71,078.—ATTACHING THILLS TO CARRIAGES.—Wm. Starkey, Bridgeport, assignor to himself and E. L. Reeves, Paulsboro, N. J.

I claim the block, B, with its projections, d d, their openings, e e, and recess, c, in combination with the bar, A, and its pins, b, the whole being constructed, arranged, and operating as described.

71,079.—SHRINKING AND PUNCHING MACHINE.—C. V. Statler, Woodhull, Ill.

I claim, 1st, The bar, B, the gripe blocks, D and E, with their levers, k k', the kink block, G, and the eccentric lever, J, when the same are constructed, arranged, and combined, substantially as shown and described and for the purposes set forth.

2d, In combination with the upsetting device set forth in the preceding claim, I claim the arrangement, as described, of the punch and punch block, C.

71,080.—DROP PRESS.—Norman C. Stiles, Meriden, Conn., and John S. Miller, Springfield, Mass., assignors to Norman C. Stiles.

We claim, 1st, The endless belt, D, of leather, or analogous material of uniform character, in combination with the hammer, E, and with the wedge, G, or its equivalent, for directly connecting and disconnecting the hammer, the whole being combined and arranged substantially as and for the purposes herein set forth.

2d, The tripper, I', and suspending stop, J, mounted together on the movable block, I, so that both the tripper and the stop may be adjusted at the various hights required by a single operation, substantially as and for the purpose herein specified.

3d, The provision for dropping the hammer at will at any desired lower point than the tripper, I', the same consisting of the piece, L, standing always parallel with the motion of the hammer, and moved against the wedge, G, or its equivalent, at the desired moment, irrespective of the elevation of the hammer at that moment, substantially as and for the purpose herein set forth.

4th, The weighted stem, R, or its equivalent, operating as specified, in combination with the wedge, G, or equivalent device, operated by the said stem, and with the hammer, E, and belt, D, causing the hammer to be firmly connected to the belt by the act of striking on the object below, so that when the object struck is high, the belt will be seized at a corresponding level, and as the object is hammered down or turned over, so as to cover the upper surface, the belt will be seized at a corresponding lower level, all substantially as and for the purpose herein set forth.

5th, The adjustable front piece, A2, in combination with the guides, A1 A2, having grooves of the form specified, and with the holding means, A4, and adjusting means, A5, all arranged for joint operation, in connection with the hammer, E, or its equivalent, substantially as and for the purposes herein specified.

71,081.—DOOR AND GRATE SPRING.—Enos Stimson, Montpelier, Vt.

I claim, 1st, The springs, D, and rock shaft, C, in combination with the slotted main castings, B, substantially as described, in combination with the clasps, F, in manner and for the purposes substantially as herein shown and described.

2d, The loose pulleys, E, in combination with the springs, D, and rock shaft C, substantially as herein shown and described.

3d, The stop, g, in combination with the main castings, B, and rock shafts, C, substantially as herein set forth and described.

71,082.—MODE OF CHURNING BUTTER.—Jacob Strobeck, Parishville, N. Y.

I claim the construction and application of the scraper, H, the arrangement of the breakers, I I I I, with the means of adjustment and form of the dasher blades and mode of attachment to the shaft, F, in combination, as shown and described.

71,083.—GATE SPRING.—W. W. Sutliff, Town Line, Pa.

I claim the flat curved spring, a, hinged to the gate, A, and secured at one

end in the notched block, b, arranged and operating as and for the purpose specified.

71,084.—WRITING APPARATUS FOR THE BLIND.—John Synnott, San Francisco, Cal.

I claim, 1st, The table with pins, b b, and the hinged frame, B, with notches or slots, a a, substantially as described for the purpose set forth.

2d, The bars, E F, and the measuring block, H, with the pin, I, together with the following block, G, with its projections, c, and lug, d, substantially as and for the purposes described.

71,085.—BRONZING MACHINE.—J. F. Tapley, Springfield, Mass.

I claim, 1st, In combination with a drum for carrying the paper, one or more reciprocating pads or brushes for spreading the bronze or color.

2d, Arranging a revolving brush within the feed box for the purpose of feeding the bronze on the sheet through openings in the bottom of the box.

3d, The feed box, C, with revolving brush, having the roll, G, operated by the cam, E, upon the cylinder or drum, A, arranged as described.

4th, The gate, K, operated by the cam, E, upon the drum, A, as and for the purpose described.

5th, The springs, o, in combination with the reciprocating pads, n a, etc., as and for the purpose described.

71,086.—MACHINE FOR DIGGING POST HOLES.—J. Thompson and B. B. Herrick, Edgewood, Ill.

We claim, 1st, The shovel, U, hung to roller, V, by means of levers, W, and operated by means of lever, Z, rod, X, and crank, y, for the purpose of catching the dirt drawn out by auger, E, substantially as herein specified

2d, The combination of the standards, B, having a slot, L, with sash, C, shovel, U, and auger, E, arranged and operating as herein described.

3d, The combination of the capstan, N, pawl, T, sash, C, standards, B, shovel E, levers, W Z, rod, X, and crank, y, substantially as and for the purpose set forth.

71,087.—HAND LOOM.—T. Henry Tibbles (assignor to himself and F. L. McHenry), Kansas City, Mo.

I claim, 1st, The single upright picker staff, a, the sliding weight, g, and the straps, b and h, in combination with the lay, C, the breast beam, D, and the drivers, d d, constructed, arranged, and operating substantially as and for the purpose described.

2d, The cam rollers, k k, operated by the bent lever, q, as described, in combination with the heddles B, and the lay, C, operating as and for the purpose herein specified.

71,088.—STUMP EXTRACTOR.—John Turner, Grand Haven, Mich.

I claim the combination of the frame, A, with the working beam, B, the levers, C C, hung upon the bearings, D D, the braces, E E, the links, F F, the double rack, G, the chains or ropes, H H, the blocks, I I, and the hook, K, all arranged substantially as described, for the purpose designed.

71,089.—CONFECTIONERY.—F. Walter, St. Louis, Mo.

I claim the egg, A, when combined and arranged with the ornaments, B B', and the magnifying glass, b, as described and set forth.

71,090.—WASHING MACHINE.—Horace Warner, Lake City, Minn.

I claim the hanger driving-shaft, K, with arms, L, attached, the quadrangular sliding framework, E, with the spring catches, H, and pressure spring, S, the improved manner of constructing ribs, c, and rollers, m, by cutting transverse notches upon their elevations, and the combination and arrangement of the whole for the uses and purposes herein specified.

71,091.—MACHINE FOR CUTTING AND FORMING WIRE.—J. Wasson, Elyria, Ohio.

I claim a machine for forming and cutting wire for tinners' and other purposes, constructed mainly of the guide marked, B, the rollers, E, the gearing, D, the shaft, D', the knife, C, and the stand, G, or their equivalents, arranged substantially as described.

71,092.—FASTENING FOR CORSETS.—A. W. Webster, Ansonia, Conn.

I claim a corset-fastening, composed of the wire, A, attached to the busk by its own ends, substantially as described and for the purpose set forth.

71,093.—THRASHING MACHINE.—Stanton D. Warner, Richmond, Ill., assignor to himself, Jonathan S. Roberson, John Black, and E. B. Brewster.

I claim 1st, The adjustable plates, A A, of straight or curved shape, constructed as described, provided on their inner sides with graduated teeth of the described shape, and operated in a reciprocating or vibrating manner by means as described; or other equivalent means, substantially as herein set forth.

2d, The endless apron cylinder, G, provided with flat triangular prongs, L, L, for the purpose described, and operating in combination with the adjustable vibrating plates, A A, as described and specified.

3d, The notched flexible bars or rods, H H, attached to the rear end of and combined with the vibrating plates, A A, arranged and operating substantially as herein set forth.

4th, The wire jog sieve, N, or sieves, constructed and operating as described, in combination with the vibrating plates, A A.

71,094.—FOUNTAIN BRUSH.—Joseph B. Warren, South Danvers, assignor to Geo. B. Melcher, Salem, Mass.

I claim my improved fountain brush, having not only a duplex padded valve, as described, but two perforated bearing plates or seats thereto, and the valve, or a projection from it to turn on a center between such seats, and extend through an opening or slot in the side of the case substantially in manner and so as to operate as specified.

Also the brush fountain, as made not only with a socket to receive the brush in manner as described, but with the two valve seats, and a valve arranged between and so as to operate with them in manner substantially as explained.

71,095.—RUBBER SHOES.—J. Weidenman, Hartford, Conn.

I claim 1st, The bar, A, having a strap, a', formed upon its lower end, and attached at its upper end to the rear part of the rubber shoe, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the curved arms, B, with the bar, A, substantially as herein shown and described and for the purpose set forth.

71,096.—BROADCAST SEEDING MACHINE.—Augustus Weitman, West Union, Iowa.

I claim 1st, Providing the harrows, L M M, any or all of them, with cleaning bars, k N, arranged or applied in the manner substantially as and for the purpose set forth.

2d, The combination of the seed-box, D, with its perforated bottom and slide, E, adjustable bar, K, discharge board, J, and roller, C, all arranged substantially in the manner as and for the purpose set forth.

3d, The reciprocating knotted rope, I, or its equivalent, operated by the frame, G, from the roller, C, in combination with the adjustable bar, K, and the discharge board or plate, J, all arranged substantially as and for the purpose specified.

4th, The harrows, L M M, combined constructed, and applied to the machine substantially in the manner as and for the purpose set forth.

71,097.—HARVESTER.—Peleg Werni, Chicago, Ill.

I claim the combination and arrangement of an endless revolving sickle, L, sheaves, J K, gear wheels, G H, shafts, F B, wheels, C E, and chain, D, clutch, Z, arm, Y, and levers, V, operating in the manner and for the purpose set forth.

71,098.—HARVESTER RAKE.—Peleg Werni, Chicago, Ill.

I claim 1st, The plate or disk, A, in combination with the bars, B and C, and the arm, H, of the rake, when constructed and operating substantially as and for the purposes described.

2d, In combination with the arm, H, of the rake, the supporting arm, M, pivoted at h, about which point it has a vertical movement, carrying the rake in both the effective and non-effective stroke, substantially as and for the purpose set forth.

3d, The combination of the said rake arm, H, and swinging supporting arm M, pivoted as aforesaid, with the rollers, I J, and their connection, K, arranged in the manner set forth, and operating as described.

4th, The combination of the revolving plate, A, provided with projections, a b, the arms, B C, the rake arm, H, provided with a double joint, as described and the movable supporting arm, M, arranged and operating as and for the purposes specified.

71,099.—CORRUGATED IRON REVOLVING COAL SCREEN.—E. W. Weston, Providence, Pa.

I claim constructing a revolving iron coal screen with corrugated sides, substantially in the manner and for the purpose herein described.

71,100.—MACHINE FOR BENDING TIRES.—Dennis Wetzel, Springfield, Mo.

I claim 1st, The double rimmed wheel, B, and double rimmed, roller, E, disposed in frame, A, substantially as above set forth and described.

2d, The wheel, B, and roller, E, in combination with the spring, F, arranged and operating as and for the purposes substantially as above set forth and described.

71,101.—LUBRICATOR FOR CARRIAGE WHEEL BEARINGS.—W. P. White, Orland, Me.

I claim the wheel greasing or lubricating apparatus as described, that is as composed of the cylindrical cup, A, the cover, B, and the plunger, C, with their connection screws, c d, and discharge passage, b, or the same and the screw, a, the whole being arranged substantially as explained.

71,102.—CAR-BRAKE AND STARTER.—John Wiley, 2d, South Reading, Mass.

I claim 1st, The combination and arrangement of the toothed bar, S, arms, g1 g2 of the brake bar, G, toothed friction wheel, F, lever, O, connecting rods N, yokes, L, roller, M, frame, E, axle, D, and shaft, I, substantially as described for the purpose specified.

2d, The combination and arrangement of the treadle pin, V, treadle lever, U, spring, X, roller, W, arms, g1, of brake-bar, G, toothed bar, S, and frame, E, substantially as described for the purpose specified.

3d, The combination of the draft bar, J, connecting strap, K, spring, H, brake bar and ratchets, G, with each other and with the frame, E, of the car substantially as herein shown and described and for the purpose set forth.

71,103.—PRINTING APPARATUS.—J. M. Wilbur, Cleveland, Ohio.

I claim 1st, The governor-device, k, constructed in the manner described to operate as and for the purpose set forth.

2d, The cylindrical ink holder, F, constructed in the manner described, to operate in the manner shown, as and for the purpose set forth.

3d, The driving mechanism, when regulated by the governor-device, k, constructed as described, and combined with a printing machine, substantially as and for the purpose set forth.

4th, The cylindrical removable stereotype, D, provided with the changeable dating-type, X, and permanent inscription, W, when used in combination with the automatic printing machine described, as and for the purpose set forth.

71,104.—STEREOTYPE CASTING.—J. M. Wilbur, Cleveland, Ohio.

I claim the stereotype-pan, A, provided with the ledges, a a, in combination with the plates, B B, constructed substantially as and for the purpose set forth.

71,105.—HAND STAMP.—J. M. Wilbur, Cleveland, Ohio.

I claim forming the printing surface, A, of a hand-stamp in the manner described and for the purpose set forth.

71,106.—SAFETY ATTACHMENT FOR POCKETS.—Edward Williams, New York city.

I claim the safety-attachment for watch pockets herein described, the same consisting of the holder, B, having two jaws, F and G, the one swinging upon a hinge joint and held in proper position by a spring, and the other moving in a sleeve in part, D, and actuated by a spiral spring, the whole arranged and combined to operate substantially as specified and for the purpose set forth.

71,107.—MEANS FOR SECURING AND RELEASING HORSES.—Charles Wills, New York city.

I claim the spring-bolt, A, in combination with wire, B, pitch-chain, B1, plate, F, ring, B2, angle-piece, G, and knob, H, substantially as and for the purpose herein specified.

71,108.—PAPER-MAKING MACHINE.—Edwin Wilmot, Laona, N. Y.

I claim 1st, The employment of two or more rubber rollers, in combination with the endless apron, C, substantially as and for the purpose set forth.

2d, The rubber rollers, F F, in combination with the metallic or wooden roller, I, for the purpose of giving additional pressure to the paper, substantially as and for the purpose set forth.

3d, The employment of the rollers, H H' and L, substantially as and for purpose described,

4th, In combination therewith, I claim the rubber rollers, F F, and metallic or wooden roller, I, suostantially as and for the purpose set forth.

71,109.—BOILER CLEANER.—G. W. Wiswell, Pilot Knob, Mo.

I claim the construction and arrangement of the pipe, B, with reference to its tapering dimensions, and its flattened end, b2, when applied to the boiler, A, as described and shown.

71,110.—BURGLAR-PROOF SAFE.—Linus Yale, Jr. Shelburne Falls, Mass.

I claim making an open space between the edges of the door and the door frame, substantially as and for the purpose specified.

71,111.—SNOW-PLOW.—J. S. Zane, Pleasant Plains, Ill.

I claim 1st, The double mold board, D, hinged at the upper end of the incline planes, A A, to be raised and lowered as and for the purpose herein described.

2d, The arrangement of the inclined planes, A A, forming a ridge in the middle, the vertical cutters, s s, and the movable cutter, p, substantially as described,

71,112.—LAMP EXTINGUISHER.—C. E. Abbot, Malden, Mass.

I claim 1st, The arrangement for conjoint operation, of the tongue, t, and finger, m, as and for the purpose set forth.

2d, The spring, s, in combination with the pin, l, and lever, h, arranged and operating as specified.

3d, The stop-notch, n, on lever, h, operating as and for the purpose described.

71,113.—COTTON AND HAY-PRESS.—B. B, Alfred, La Grange, Ga.

I claim 1st, The combination of the slotted levers, L L, with the box, D, blocks, e e, and follower, F, substantially as and for the purposes specified.

2d, The combination of the parts referred to in the foregoing claim, with the double acting compound screw, C C', substantially as and for the purposes set forth.

71,114.—APPARATUS FOR RAISING AND LOWERING WINDOW-BLINDS AND CURTAINS.—Geo. Allix, St. Helier's, Island of Jersey.

I claim 1st, The combination of the slit, guide, and chain, arranged with reference to each other and a window blind, curtain, etc., so as to operate substantially in the manner set forth, the combination being substantially such as described.

2d, The combination of the slit, guide and chain with the lever, which, when lifted moves the chain out of the slit, the combination being substantially such as herein set forth.

71,115.—DINNER PLATE.—J. K. Andrews, Antrim, Ohio.

I claim a plate provided with partitions in the center and with a rim in the usual form, for the purposes set forth.

71,116.—BUCKLE.—J. K. Andrews, Antrim, Ohio.

I claim the plate, A, formed substantially in the manner herein represented, for the purpose of confining together straps without stitching or riveting, as herein fully set forth.

71,117.—MALT HOUSE OR KILN.—Wm. Appleton, Albany, N.Y.

I claim 1st, The induction of a current or currents of air over the malt floor, by means of draft pipes or tubes, G, connecting said floor or chamber with the heating-chamber of the kiln and in drying the malt substantially as and for the purposes specified.

2d, The combination of the flue, S, with the flue, G, to the malt floor, C, and heating chamber, F, for operation together as herein set forth.

3d, The flue, N, in combination with the heating chamber, F, malt floor, C, and flues, G and S, for action in concert as specified.

71,118.—CARRIAGE SPRING.—J. B. Ashley, (assignor to himself and J. A. Brownell), New Bedford, Mass.

I claim the spring, C2, and linking plate, E2, and clip-iron, D2, in combination with the packing, A1 A2, and bolts, B2 B2, all arranged and applied substantially as and for the purpose described.

71,119.—ARTIFICIAL FUEL.—J. E. Atwood, Trenton, N. J.

I claim artificial fuel composed of coal tar, coal dust, peat and lime, substantially as described.

71,120.—APPARATUS FOR MAKING STAMP-GILT PAPER HANGINGS.—William Bailey, New York city.

I claim 1st, The combination of the rotating impression cylinder, the rotating pattern cylinder, and the heating apparatus, or the equivalent thereof, as specified, for supplying the pattern cylinder with heat.

2d, The combination of the rotating impression cylinder and the rotating pattern cylinder with the devices, or the equivalent thereof, substantially as described for securing and adjusting the pattern plates on the pattern cylinder.

3d, The combination with the impression and pattern cylinders of a registering belt, constructed and used substantially as and for the purposes herein specified.

4th, The special devices herein described, for securing the pattern plates to the cylinder.

71,121.—PISTON PACKING FOR STEAM ENGINE.—James Barwick, and Samuel Tindall, Silvertown, Eng., assignors to themselves and Chas. T. De Forest, Stamford, Conn.

We claim the application and use, for the purposes hereinbefore described, of hard india-rubber or its equivalent, mixed with oil or grease, substantially as herein set forth.

71,122.—PUMP.—John Bean, Hudson, Mich.

I claim the pump constructed with the cylinder, D, formed of staves held together by india-rubber bands, and the tube, E, in the chamber of the pump stock, and with the diaphragm, G, and the rod, B, as and for the purposes herein set forth.

71,123.—LATCH FOR CARRIAGE DOOR.—Norbert Belvallette, Paris, France.

I claim a pendant handle or tassel, of any material, acting upon a carriage lock with a lever or other apparatus in place of the fixed handles at present in use inside of carriages.

71,124.—METALLIC CAPSULES FOR BOTTLES.—Wm. Betts, Wharf Road, Eng.

I claim a metallic capsule, constructed for application to the neck of a bottle, as described and on which a trade mark or title is stamped or otherwise permanently imprinted, for the purpose specified.

71,125.—AXLE BOX.—William A. Boyden, Altoona, Pa.

I claim the two semicircular packing plates, C, constructed with rebated ends and furnished with springs, g, in combination with the annular washer, D, the journal, a, and the bearing, b, of the axle box, substantially as and for the purpose herein set forth.

71,126.—CARPENTERS' WORKBENCH.—James Bragdon, Boston, Mass.

I claim the combination of legs, c, and slotted and notched braces, f, when constructed, arranged, and operating substantially as specified.

71,127.—SPINDLE BOLSTER.—John E. Brown (assignor to himself and John Q. Wright), Fitchburg, Mass.

I claim, 1st, So constructing a bolster spindle that the oil for lubricating the latter is automatically supplied at a point above the level of the oil in the bolster cup, substantially as described.

2d, Constructing the bobbin holder, D, with a chamber in its lower end for receiving the sleeve which is formed upon the oil cup, E, said holder being secured to the spindle, A, so as to rotate with it, substantially as described.

3d, The spiral groove, c, formed in the chambered bobbin holder, D, in combination with the sleeve, b, formed on the oil cup, E, substantially as described.

4th, The outlets, d d, through a chambered bobbin holder, D, or the equivalent thereof, in combination with a device which allows oil to rise from cup, E, substantially as and for the purpose described.

71,128.—HOP VINE SUPPORT.—C. T. Bush, Rensselaerville, N. Y.

I claim, 1st, The cap, s, provided with one or more sockets, constructed substantially as and for the purpose set forth.

2d, The arrangement and combination of the short poles, p p p, caps, s s s, and branches, a a a, substantially as described.

71,129.—COAL STOVE.—William M. Bush and Thomas B. Richards, Cincinnati, Ohio.

We claim, 1st, The combination of the annular horizontal plate, H, and annular converging plate, B, forming a close flue for the admission of air with the chimney, C, substantially as shown.

2d, The concentrating flange or ring, E, in connection with the chimney, C, and plate, B, substantially as described.

71,130.—WOODEN BUILDING.—Joseph Busser, Troy, Ohio.

I claim the construction of the outer, or both the inner and outer, surfaces of the outer walls of wooden buildings and the walls themselves of planks shaped and arranged substantially as herein described as shown.

71,131.—SEWING MACHINE.—Caleb Cadwell, Waukegan, Ill.

I claim, 1st, The combination of the shaft, J, crank, W, and crooked connecting rod, R, the cam or projection, c, arms, a5 a7, and rod, a8, and the link, K, rod, M, and annular lever, said parts being arranged substantially as described and employed to operate the needle slide, thread tightener, and shuttle, as explained.

2d, The combination of the needle bar, T, collar, a, connecting rod, U, and arm, V, for operating the feeding foot, H1, substantially as described.

3d, The feeding attachment composed of the bent forked lever, V, the perpendicular bar, H2, operated by the short lever, e", and the spring, s''', the pivoted bar, o''', bearing the feeding foot, H1, the gage screw, Z', and the spring, x', all arranged and combined in their operation substantially as and for the purpose described.

4th, The ring, G', supported in the outer ring, D', in which its position is regulated by the clamping key, g'', the thumb piece, g''', and the spring, e''', having the arm, H2, to support the upper ring, G'', and the double arm, H3 H4, to guide the feed foot, H1, and bearing the feeding attachment, all constructed and arranged substantially as and for the purpose specified.

5th, A thread-tightener device consisting of the parts, a5 a7 a8 e c3 and Y, arranged and operating substantially as described.

6th, A shuttle constructed as herein described and having an internal tension device consisting of the parts, ax cx dx.

7th, The bracket, K, with its bearings, t n, in combination with pivoted lever, L', spring, l2, adjusting nut, v, and spool, constructed and arranged as herein described.

8th, The spring, x, applied to the spools, M1 M2, in the manner and for the purpose specified.

9th, The bobbin or spool winder, n', with the shaft, z, pulley, a', adjustable bearings, y y', hinged at b', and spring, c', when constructed and operating as herein described.

71,132.—HARNESS ROSETTE.—G. S. Caldwell, Syracuse, N. Y.

I claim a glass rosette, A, provided with an ornamental lining or backing, c c, and secured to the plate, B, from the button, D, substantially in the manner and for the purpose set forth.

71,133.—TRANSPLANTER FOR GARDER USE.—Hiram Carmichael, Rochester, N. Y.

I claim as an improvement in transplanter making the two blades, B, detachable by means of the screw joint, substantially in the manner shown and described, whereby either blade may be used as a garden trowel.

71,134.—COMBINED PLANTER AND CULTIVATOR.—Isaac H. Chappell, Decatur, Ill.

I claim, 1st, The wide tires, R R, when attached substantially as described, for the purpose specified.

2d, The links and hooks, B B, with the connecting rods, C C, and steadying bar, D, arranged substantially as described for the purpose designed.

3d, The crotched stakes, E, and levers, F, arranged substantially as set forth for the purpose specified.

4th, The slotted bar, G, and lever, H, for the purpose designed.

5th, The combination of the cultivator and planter when built substantially as hereinbefore set forth and for the purposes specified.

71,135.—BLIND FASTENING.—Edward A. Chavantre, Newark, N. J., assignor to Alfred Chavantre, New York city.

I claim the bolt, n, taking the notches of the hub of the hinge in combination with the latch bar, r, jointed to the shank, m, of said bolt, n, as and for the purposes set forth.

71,136.—GARMENT SUPPORTER.—H. M. Clemence, Worcester, Mass.

I claim the movable metal arms, B and C, in connection with the hanger, A, and thumb screw, D, by means of which the supporter is adjustable to garments of any size.

71,137.—HORSE HAY FORK.—Abraham Coates, Watertown, N. Y.

I claim, 1st, In hay forks such as described the combination of a center bar wedge shaped or provided with inclined sides as specified with claws or barbs pivoted to the sheath of the fork and provided with correspondingly inclined or bevelled ends under such an arrangement that when the said claws are projected from the sheath the inclined sides of the center bar will be held between the said ends of the claws, in the manner and for the purposes hereinbefore stated.

2d, The combination with the slotted center bar and wedges formed therein of the claws or barbs pivoted to sheath of the fork and constructed and arranged for operation as herein described.

3d, The combination with the center bar and claws and hinged connecting rod of the lever to the shorter arm of which said rod is pivoted and the detent or locking device, under the arrangement and for operation as herein shown and set forth.

4th, The combination with the lever for operating the center bar and claws of the detent or locking device, and its spring under the arrangement specified so that both the said lever and the detent by which it is held in position may be actuated simultaneously and at one operation, as set forth.

71,138.—TOY HOOP.—John M. Crawford and Horace L. Hervey, Philadelphia, Pa.

We claim a toy hoop in which hoop, A, handle, D, wire, E, animal, G, and bells, I, are combined, substantially as and for the purposes set forth.

71,139.—BUILDING SCAFFOLD.—N. B. Crawford, Bennington, Vt.

I claim the scaffold poles, c, fitted to be extended in length as set forth in combination with the winch barrels, f, frames, m, and platform, n, as and for the purposes specified.

I also claim the platform, n, formed of sections hooked together, in the manner set forth.

71,140.—SCAFFOLD FOR ROOFS.—N. B. Crawford, Bennington, Vt.

I claim the platform, b, sustained on the skids, c c, in combination with the winch barrels, d, ropes, f, pulleys, g, and claws, l, as and for the purposes set forth.

And in combination therewith, I claim the ladder, h, applied as and for the purposes specified.

71,141.—FURNACE FOR SOLDERING.—Lewis Cutting, San Francisco, Cal.

I claim a soldering furnace having heaters, G G, provided with plates, H H, for utilizing the heat of the furnace substantially as described and in combination with the heaters provided with plates, H H.

I claim filling the center of the heater with gypsum, fire brick, or some slow conductor of heat.

I also claim, in combination with the heaters, G G, the top cover of the furnace formed of gypsum, fire brick, or other slow conductor of heat, substantially as described and for the purposes set forth.

71,142.—TOOTH POWDER BOTTLE.—J. B. Da Camarah, Jr., Newark, N. J.

I claim tube, C, substantially as and for the purpose specified.

71,143.—PAPER BAG.—George Dare and Diana Dare, Auburn, N. Y.

We claim the manner of folding a piece of paper upon each side of its center for the purpose of forming a bottom the superficial measurement of which shall be the same as the mouth of the bag, substantially for the purpose set forth.

71,144.—TUBE WELL.—T. J. Dean, St. Louis, Mo.

I claim a tube well its lower section consisting of two concentric perforated tubes one wire gauze tube surrounding the interior perforated tube and another lining the exterior perforated tube, a body of filtering material being placed between the two tubes of gauze, all substantially as shown and described.

71,145.—SELF-LUBRICATING GIB.—W. A. Devon, Port Richmond, N. Y.

I claim, 1st, A gib constructed in two parts, as shown by A B, and fastened as seen at a a, or their equivalents, substantially as herein set forth.

2d, The self-oiling device as shown in D and C, with the roller, d, and slot, l, and slides, c, the spring, g, in connection with the wick, b b b, or their equivalents, substantially as and for the purpose herein set forth.

71,146.—FENCE.—Benjamin K. Dorwart and George F. Rote, Jr., Lancaster, Pa.

We claim the braces, B B, pivoted at their upper ends to the blocks which connect the panels or to the posts, substantially as and for the purpose set forth.

71,147.—FENCE.—Benjamin K. Dorwart and George F. Rote, Jr., Lancaster, Pa.

We claim, 1st, The keys, E E, constructed as described and used with the braces, G, pins or wedges, a a, and panels, A B C D, as and for the purpose set forth.

2d, The swivel block, H, as constructed and used with the permanent post and panel, as and for the purpose set forth.

71,148.—NAIL PLATE FEEDING DEVICE.—Daniel Drawbaugh, Eberly's Mill, Pa.

I claim, 1st, The combination of the spring fingers on the vibrating yoke arm, E, and the spiral flanges upon the tubular bearing, c, through which the nail plate feeding rod passes, for the purpose and in the manner substantially as described.

2d, The combination of the tubular bearing, c, nail feeder, F, and universal joint, C5, arranged substantially as and for the purpose described.

3d, The combination of the loaded lever, k, arranged upon the outer end of the nail-feeding rod, F, with the cord, weight, and pulley for feeding the nail rod with the nail plate up to the cutters, substantially as and for the purposes described.

4th, The hooked plate, S', and spring, S, applied to the bracket, A', substantially as described.

5th, Providing for automatically stopping the rotary motion of the nail rod and at the same time releasing this rod from the hooked plate, S', by means substantially as described.

6th, The combination of brake rod, l, on lever, H, with a friction wheel on the shaft, i, of the pulley, J, substantially as described.

7th, The adjustable post, G b, in combination with the laterally adjustable bracket, A', substantially as described.

71,149.—BREECH-LOADING FIRE-ARM.—Julius Elson, Boston, Mass.

I claim, 1st, The lever, C, provided with the grooved nut, d, in combination with the projection, e, and the hinged screw rod, b, as and for the purpose set forth.

2d, The combination of the solid breech block, B, when constructed as described, the hinged barrel, A, the projection, E, and the hinged screw rod, b, as and for the purpose specified.

71,150.—HOLDER FOR LAMP AND GAS SHADES.—Charles W. Emerson, Hartford, Conn.

I claim a holder for lamp and gas shades formed with the ring, a, wires, b b, and spring ends e e, over which the ring, f, of the shade, g, is passed and held, as set forth.

71,151.—CARRIAGE TOP.—Sidney Emmones and Elnathan S. Simpson, Geneva, N. Y.

We claim one or more auxiliary bows hinged to the main bows, and arranged to operate substantially as described for the purpose set forth.

And in combination with the auxiliary bows we claim the T-plates to which they are hinged.

71,152.—ADJUSTABLE CULTIVATOR.—John W. Ernst, Heidelberg, Pa.

I claim the diamond-shaped cultivator jointed and adjusted as herein described when combined with the teeth, shovels and regulating clevis, for the purposes set forth.

71,153.—PROPELLER.—William Fields, Wilmington, Del.

I claim a propeller for vessels consisting of a wheel, F, having from three-fourths to seven-eighths of its circumference bucketed and the balance solid or boxed set in a casing of sheet iron covered by a wheel house in combination with a weighted driving wheel, D, working upon a crank axle, C, connected with propeller shafts, E E, by means of the links or arms, D D, constructed and arranged as above described and shown by the drawings.

71,154.—POCKET BOOK CLASP.—D. E. Fisk, Springfield, Mass.

I claim a wallet clasp consisting of the tongue, A, attached to the outside of the wallet and the eye, F, attached to the flap of the same, the parts being arranged to operate substantially as shown.

71,155.—GROUT CONDUCTOR.—W. S. Follensbee, Janesville, Wis.

I claim a grout conductor composed of sections connected as described and arranged to operate substantially as set forth.

71,156.—APPARATUS FOR DISTILLING.—Andre Foubert, New York city.

I claim the arrangement of the pipes and cocks as specified in combination with two stills, for the purposes and as set forth.

71,157.—THREAD CUTTER.—W. L. Gallaudet, New York city.
I claim, 1st, The cutter in combination with the shield constructed in the manner set forth substantially as and for the purpose specified.
2d, So arranging the cutter with reference to the shield that it may be readily detached therefrom, substantially in the manner described.

71,158.—ELECTRIC SWITCH.—Samuel Gardiner, Jr., New York city.
I claim, 1, The shaft, A, and arm, E, constituting an electric switch held to to its bearing by a spring, C, to insure metallic connection, substantially as described.
2d, The cam collar, H, employed to withdraw the switch from its bearing in the act of rotation, as explained.
3d, The conducting plate, L, employed in combination with the rotary switch, A E, and cam collar, H, to impart a given number of impulses by a simple rotation of the switch, as set forth.
4th, The lighting key, M, in combination with the gas-turning device, A E C H L, for the purposes set forth.
5th, Thecombination of the indicating dial, J, and index, K, with the rotary switch, A E, as and for the purpose set forth.

71,159.—STEAM ENGINE.—Edwin Garfield, Hartford, Conn.
I claim the valve, b, in combination with the double exhaust passage, a a', and the steam exhaust part, d, substantially as and for the purpose described.

71,160.—REGULATOR FOR MOTIVE POWER.—James E. Gillespie, Boston, Mass.
I claim, 1st, The mode of operation whereby a compound action is given to the shield, T c, by means of the levers, K and M N, or their equivalents, thereby causing it to be replaced in its normal position by the action of the pawls, S S, without in any degree preventing it from being moved as usual by a governing device.
2d, The cam, H, and lever, K, or their equivalents, in combination with a power regulator, substantially as specified and for the purpose set forth.

71,161.—PORTABLE CANDLESTICK.—Charles P. Gorely, Boston, Mass.
I claim a support for a candle so constructed and applied as to clasp candles of varying diameters and capable of being lowered with the consumption of the candle as well as to inclose a very small portion and allow it to be nearly if not entirely consumed.
Also the peculiar construction of the duplex spring clamp composed of the jaws, a a and b b, and handles, c c, or any mechanical equivalents therefor, substantially as hereinbefore explained.
Also the portable candlestick as composed of the disk, f, socket, e, post, d, spring clamp before described and folding handle, g, the whole being combined and operating together substantially as hereinbefore described.

71,162.—TOY PISTOL.—John Hall (assignor to himself and Charles S. Locke), Watertown, Mass.
I claim the repeating toy pistol, made substantially as specified, viz.: with the magazine and barrel, the opening from one into the other, the spring and piston, and mechanism for retracting the piston and discharging it, the whole being arranged in manner and so as to operate substantially as described.
Also the combination and arrangement of the catch lever, f, the slider, h, the trigger, i, the spring, k, and the cam or inclined plane, m, the whole being as specified and for effecting the retraction of the piston, contraction of the spring, and the discharge of the piston, in manner as described.
Also the combination of the stop pin and the slot or groove, o, or their mechanical equivalent or equivalents, with the piston, its spring, the magazine, the barrel, and mechahism for effecting,the retraction and discharge of the piston, in manner as specified.

71,163.—MACHINE FOR PRESSING PEAT, CLAY, ETC.—Ezra M. Hamilton, Minneapolis, Minn.
I claim the combination and arrangement of the pulverizing roller, D, staupers, N, operated by the tappers, Q, and shaft, H', with the shaft, G', and crank, S', working the lever, S, with spring, V, and block, V', to push the cakes of peat out of the molds, M', all for joint operation as herein described.

71,164.—HARVESTER.—David S. Harner Xenia, Ohio, assignor to himself and Whitely, Fassler, and Kelly, Springfield, Ohio.
I claim, 1st, The combination of the lever, k, and rake head, l, when said lever and rake head are both pivoted to the plate, i, or its equivalent and are capable of independent vertical movements, substantially as and for the purpose set forth.
2d, The combination of the pitman, m, pivoted lever, k, and curved guides, l l, as and for the purpose set forth.
3d, The braces, j j, arranged on either side of the rake head, l, as shown so as to prevent any lateral movement of said rake head upon its bearing on the joint bolt, g.
4th, The rake head, l, moving upon a pin, e, which is about in line with the axis of the crank shaft. Said rake head is between said pin and the main frame, as set forth.
5th, The adjusting bar, W, connected to the main frame and coupling arm or its equivalent, for the purpose of adjusting the angle of the cutters and the position of cutter bar and platform.
6th, The following instrumentalities, combined and arranged substantially as set forth, in a harvesting machine having a floating platform and two driving wheels, to wit, the sweep rake, l, pivoted lever, k, pitman, m, crank, n, and geared wheel, p, meshing with a driving pinion on the main pinion shaft between the two driving wheels.
7th, The spring latch, b, constructed so that the latch and spring are formed of one piece in combination with the rake head, l, and arch, a, substantially as and for the purpose set forth.
8th, The combination of the pivoted arm, k, plate, i, and guides, l l, connecting rod, m, and crank, n, or their equivalents, so that the mechanism which drives the rake shall be connected thereto, outside of the center upon which said rake moves, substantially as shown.
9th, The arrangement of the rake head, l, in relation to its center pin, c, to wit, on that side of said center pin which is toward the main frame and cutting apparatus so as to reduce the necessary length of the platform, as set forth.
10th, The loose or rolling joint between the coupling arm, S, and bracket, U, shown in Figs. 1 and 4, in connection with the curved drag bar, R, as and for the purpose set forth.

71,165.—CIDER PRESS.—John H. Harper, Pittsburg, Pa.
I claim the rubber-faced disks, G G, upon the lower platform of the frame, as set forth, and used in combination with the disks, D D, for the purposes set forth.

71,166.—SCREW NAILS.—Hayward A. Harvey, New York city.
I claim a screw nail, composed of a proper head, and a body surrounded by nicks, which are diagonal to the axis of the nail, and at their ends extend into other nicks, so as to constitute a continuous irregular spiral nicking around the body of the nail, the nail, as a whole, being substantially the same as hereinbefore described.

71,167.—HORSE HAY-FORK.—Isaac J. Hattabough, Santa Clara County, Cal.
I claim the slotted ring hinge, B' d, or its equivalent, and the claw-shaped teeth, c' c' c' c' c' c' c', in combination with the rake heads, C C, and levers, E E, all arranged and operating substantially as above set forth.

71,168.—LAMP SHADE.—E. K. Haynes, Hanover, N. H.
I claim a segmental lamp shade, supported upon a frame of wires, constructed substantially as above set forth.

71,169.—SPRING FOR BED.—E. S. Hayward, Roxbury, Mass.
I claim a spiral spring with the largest circumference at some point between the ends, substantially as and for the purpose described.

70,170.—MODE OF CLEANING WOOL.—Henry Hayward, Brooklyn, and John M. Pendleton, New Brighton, N. Y.
We claim, 1st, In connection with the within described method of destroying burrs and other vegetable fiber found mixed with wool, by means of acid, the employment of carbonate of soda or carbonate of potash, as a neutralizer for the acid in the yolk or grease on the surface of the wool, so as to form a salt in the substance of the woody fiber, and to agitate the mass by the gas liberated, substantially as herein specified.
2d, In connection with the destruction of the woody fiber in wool by chemical agents, as specified, the recovery of the partially saponified grease by treating it with caustic soda, and afterwards with salt or sulphate of soda, or both, and allowing it to rest, all substantially in the manner and for the purpose herein set forth.

71,171.—HOT AIR STOVE.—Thomas Henney, Dubuque, Iowa.
I claim, 1st, The chamber, C, arranged between the base, A, and top section, D, and provided with communications, E, F and F', in combination with the division, b, and a damper, c, substantially as and for the purposes described.
2d, The combination of the intermediate chamber, C, top chamber, D, single wall fire chamber, B, short pipes, E, F, and long pipes, a a, substantially in the manner and for the purpose described.

71,172.—CORN PLANTER.—J. Warren Hitchcock and James K. Deyo, Morrisville, N. Y.
We claim a corn planter having drill plows, B, coverers, C, sliding bars, F F and G G, springs, M, pins, Y Y, and holsting apparatus, described, constructed and arranged substantially as herein specified.

71,173.—VENTILATING APPARATUS.—Leonard Hoszek, New York city.
I claim, 1st, The combination, with the vessel and revolving wheel, of the air chamber and entrance and exit pipes, all these parts being constructed and arranged as shown in Fig. 1, for joint operation.
2d, The revolving screw, arranged and operating as shown in Fig. II, for the purpose described.
3d, The combination, substantially as shown in Fig. III, of the oscillating cups and discharge pipes, for the purpose set forth.
4th, The combination, substantially as shown in Fig. IV, of the pipes, f g, with the vessels, a c, for the purpose described.

71,174.—PASTE.—Joseph E. Hoover, Philadelphia, Pa.
I claim a paste consisting of the within named ingredients, combined substantially as specified.

71,175.—HARVESTER.—James Howard and Edward Tenney Bousfield, Bedford, England.
We claim, 1st, The arrangement of the short shaft, a e, the former radial to the drive wheel, and the latter parallel to and in the same vertical plane with the former, both supported in one and the same frame, which moves about the main axle as a center, and both shafts carrying gears at their forward ends, by which the motion to drive the cutter is transmitted, as set forth.
2d, The arrangement of the rake and reel arms in the radial sockets of the same reel boss, so that they shall all revolve with the boss around a common center, and the rake have, in addition to that motion, another motion around its long shank, which is supported by and turns in as well as with said boss, by gears, one fixed and the other movable, as set forth.
3d, Giving a differential speed to the reels of reaping machines, in the manner and for the purpose above described.

71,176.—HEATING STOVE.—Maurice C. Hull, New York city.
I claim, 1st, The flue, g, around, or partially around, the outside of the fire chamber, substantially as set forth.
2d, The inclined plate, f, forming the top of the flue, g, for preventing the lodging of ashes or fuel, as set forth.
3d, I claim the pipes, l, applied in substantially the manner specified, to cause the products of combustion to ascend toward the top of the furnace or stove, and then descend toward the base, for the purpose specified.
4th, The flue, n, and pipes, l, in combination with the flue, g, as and for the purposes set forth.
5th, The inclined plate, l, through which the smoke flues pass, substantially as and for the purposes specified.

71,177.—POTATO DIGGER.—Wm. H. Hutchins, Lockport, Ill.
I claim the combination of the concave share or blade, d, and the prongs, b b, rigidly fixed thereto, and of the peculiar and particular shape shown, all constructed and arranged as and for the purposes set forth.

71,178.—CALIPERS OR DIVIDERS.—M. G. Imbach, Hartford, Conn.
I claim the fixed pivot, F, and movable shank, O, extending through the parts, D E, forming one leg of the calipers, when operating as described for the purpose specified.

71,179.—PLATFORM SCALE.—George W. Jackson, Wyalusing, Pa.
I claim, 1st, the use of the stirrups, g, and the stirrups, h, when performing the double purpose of affording bearings for the floor beams, k k, and the hooks or links, e, and of clasping the shafts, A, in connection with the plates, i, all arranged substantially as described, and for the purposes set forth.
2d, The slotted arms, m, on the ends of the floor timbers, F, when used in platform weighing scales, substantially as shown and described.

71,180.—BURGLAR ALARM.—E. C. C. Kellogg (assignor to himself and Theodore Hoyt), Hartford, Conn.
I claim the toggle brace, in combination with the arm, d, connected with the striking mechanism of a burglar alarm, substantially as and for the purpose herein set forth.

71,181.—COMPOUND TOOL FOR CUTTING, PUNCHING AND UPSETTING.—A. A. Kent, Lyons, Iowa.
I claim, 1st, The lever, H, as constructed, in combination with the arm, B', adjustable connecting bar, G, and lever, D, substantially as and for the purpose set forth.
2d, The combination of lever, I, plate, J, and wheel, W, with the lever, H, all constructed and arranged as and for the purposes specified.
3d, The combination of the standard, B, with bar, L, lever, D, connecting rod, G, lever, H, wheel, W, plate, J, and lever, I, all constructed and arranged substantially as herein specified.

71,182.—CHURN.—M. W. Kilgore, Baltimore, Md.
I claim, 1st, a churn, each and every feature of which being made of galvanized iron, substantially as described and for the purpose specified
2d, Constructing the blades or paddles of the dasher with their edges serrated, substantially as described and for the purpose set forth
2d, So arranging the pipe, B, entirely independent of the dasher, that a continuous current of air is fed to the cream, and introduced at a point which is near the bottom of the churn, substantially as described and for the purpose specified.
4th, The combination of the pipes, B and d d', when the same are arranged substantially as described.

71,183.—LEVER JACK.—T. J. Kindleberger, Eaton, Ohio.
I claim a lever jack consisting of the frame, A, having the rack bar, B, placed therein, and operated by means of the wheel, C, and the lever, D, when said parts are arranged to operate as herein shown and described.

71,184.—ATTACHING PICKS TO HANDLES.—Henry W. Knight, Columbus, Ohio.
I claim the combination of the blade, the handle, the overlapping straps, fastening bolt, and the wedge, when all these parts are constructed and arranged as described for the purposes set forth.

71,185.—CONSTRUCTION OF BUILDINGS.—Bernard Joachim La Mothe, New York city.
I claim, 1st, the blocks, c, applied at the intersections of the rods or tubes that form the frame of the structure, and having holes passing into or through them in different directions for the reception of the rods or tubes, substantially as set forth.
2d, The double fold at one edge of the plate, k, as at m, fig. 4, and the bent or turned edge, l, for receiving the edge of the next plate, and for connecting the plate with the rods or tubes of the structure, respectively, substantially as set forth.
3d, The sliding clamp, j, of sheet metal, with its edges folded toward each other, in combination with the plates, i, folded over at their edges and receiving the clamp, j, substantially as set forth.
4th, I also claim the method, substantially as shown in fig. 5, of fitting the sides of window sashes and window casings.

71,186.—DEVICE FOR SUSPENDING AND DETACHING ARTICLES.—Wm. C. Lane, Greenpoint, N. Y.
I claim, 1st, A hooking-rod, or device, having a hook receiving socket, C, for the elevation of the hook to its place of suspension and clearance therefrom when suspended, substantially as specified.
2d, In combination with the hook receiving socket, C, the hook-detaching horn, E, both carried by a rod or handle, essentially as described.
3d, The combination with a hook suspending device of a hook keeper, F, substantially as specified.
4th, An instrument or device consisting of a hook receiving or carrying socket, hook detaching horn, and hook keeper, all formed of one and the same piece, and attached to a common stock or handle, essentially as herein set forth.

71,187.—WINDOW SHADE.—Philip Lindemeyer, Hoboken, N. J., and Louis Lindemeyer, New York city.
We claim, 1st, The within described method of producing window shades, by preparing the fabric as recited, printing with thick size, powerfully compressing the gold leaf, or other equivalent material thereon; afterwards varnishing, printing with color over the metal, and varnishing again, all substantially in the manner and for the purpose herein specified.
2d, Zincographic window shades, produced substantially as herein specified.

71,188.—ANIMAL TRAP.—Nathan M. Linton, Wilmington, O.
I claim the combination of the hinged door, C, with the parts, B, D, E, F, and G, as and for the purpose set forth.

71,189.—WATER PROOF FRICTION MATCHES.—L. T. Luther, Oak Grove, Pa.
I claim the varnishing of the igniting ends of the matches, and the saturation of their lower parts with the saturating mixture composed of the specified ingredients or their equivalents, substantially as described.

71,190.—APPARATUS FOR ILLUSTRATING WAVES.—Chester S. Lyman, New Haven, Conn.
I claim a combination of one or more flexible wires, D E, one or more series of cranks, e f, and mechanism for revolving such cranks synchronously, the whole being arranged and applied together, and to a board or or its equivalent, substantially in manner and so as to operate as and for the purpose as specified.
Also, the arrangement and combination of the series of flexile wires, F, with one or more flexile wires, D E, one or more series of cranks, e f, and mechanism for revolving such cranks synchronously, the whole being applied substantially in manner and so as to operate as specified.
Also, the combination and arrangement of the pendulum or wire, r, with the flexile wire, D, and its series of cranks, arranged and applied in manner and to operate together substantially as hereinbefore explained.
Also, the arrangement and combination of horizontal and vertical lines going through the axes of the cranks, substantially as represented in the drawings, with the system of movable wires, or mechanism for producing the wave motion, as set forth.
Also, the combination and arrangement of the circle, p, with the system of movable wires, or mechanism for producing wave motion, as specified.

71,191.—PROCESS OF SCOURING AND CLEANSING WOOL AND WOOLEN FABRICS.—Osborne Macdaniel, New York city.
I claim, 1st, An improved process for scouring wool and woollen fabrics, and removing the oil therefrom, substantially as herein described.
2d, An apparatus, employing steam indirectly, for scouring and drying wool, combined with a still, substantially as and for the purpose herein described.
3d, Crushing the tag locks and lumps of dirt, when saturated with naphtha, preparatory to scouring the wool, substantially as and for the purpose described.

71,192.—SYSTEM OF MEASURING AND CUTTING OUT DRESSES.—John Malnight, Grass Lake, Mich.
I claim the within-described system of cutting dresses, as set forth.

71,193.—CARRIAGE WHEEL.—William H. Marshall, Sutton, assignor to himself and Hosea B. Spaulding, Merrimack, N. H.
I claim the double round tenons, c c, in combination with the mortises, f f, for the purposes as described and set forth.

71,194.—ATTACHING THILLS TO VEHICLES.—O. L. Mather, Wellsville, N. Y.
I claim the portion, B, provided with the concave bed, a, to the sides, c c, of which the central pin, b, is attached, and part, D, with the concavo-convex end fitting into the said concave bed, a, when all are constructed and arranged as herein set forth, for the purpose specified.

71,195.—GATE FASTENING.—George McCoy, Antioch, Cal.
I claim a gate fastening, having the bolt, a, operated by the lever, B, and spring, c, together with the securing lock, g, or its equivalent, constructed and operated substantially as and for the purpose described.

71,196.—INVALID AND FRACTURE BEDSTEAD.—Thomas McIlroy, New York city.
I claim, 1st, The rods, E E, cords or other connections, D D', and shafts, C C', when employed conjunctively as a means for elevating the patient above the bed, in the manner and for the purpose set forth.
2d, The sectional bed bottom, G G1 G2 G3, in combination with the segments, H H', cog wheels, I I1, shafts, I2 I3, pawls, I', notched bars, J J, and rod, J', all arranged and employed in the manner and for the purpose set forth.
3d, The device, M m m m, or any substantial equivalent thereof, to enable the employment of three or a plurality of extension weights, as and for the object set forth.
4th, The foot rest, L, provided with legs and braces, L1 L2, and adapted to be used as a table, as explained.
5th, The arms, K K', arranged so as to be detached from and united to each other, by mortise and tenon, and employed substantially as and for the purpose explained.

71,197.—ARTIFICIAL LEG.—Abner McOmber, Schenectady, N. Y.
I claim, 1st, In an artificial leg, having a ball and socket joint such as described and shown, the central eye bolt, D, arranged as shown, in combination with the pin, j, bar, e, flexible strap, m, rod, k, and spring, l, all substantially in the manner and for the purpose described.
2d, In an artificial leg, having a ball and socket joint such as described and shown, the arrangement of the bolt, D, strap, m, and rod, k, in recesses, g h h', which allow a lateral as well as a vertical articulation of the ankle, as herein described.

71,198.—HAY RAKER AND LOADER.—Gideon C. Mead, Guilford, N. Y.
I claim, 1st, The combination with the hinge piece, a, and spring, b, of the roller, c, substantially as and for the purpose specified.
2d, The combination with the slide, S, of the supplementary slide or piece, V, substantially as and for the purpose set forth.
3d, The combination with the rake heads, C, and guide, I, of the spring, J, substantially as and for the purpose described.

71,199.—SAFETY HATCH FOR WAREHOUSE.—Arthur D. Medlicott, Windsor Locks, Conn.
I claim the employment of the opening and closing rolling slat platform, d, in combination with the shafts, b, weights, g, bars, d, and platform, h, substantially as and for the purposes described.

71,200.—PRINTER'S GALLEY.—P. Gray Meek, Bellefonte, Pa.
I claim, 1st, A printer's galley, constructed with a slot at one end, and a notched plate at the other, in combination with a side stick having a T-shaped head and pawl, when the same is operated by means of spring, substantially as described.
2d, Securing the type in position by means of the side stick, D, when the same is operated by springs, substantially as and for the purposes specified.
3d, The combination of the T-shaped head, a, plate, F, having holes, e, and pins, f, substantially as and for the purpose specified.
4th, The bottom plate, A, having notches, g, in combination with the blade or pawl, b, arranged and working in a slot in the end of the side stick, D, substantially as described, and for the purpose specified.

71,201.—SNAP-HOOK.—Charles H. Miller, Buffalo, N. Y.
I claim hinging the snap tongue to the hook, in the manner substantially as herein described.

71,202.—CAR COUPLING.—George R. Moore, Lyons, Iowa.
I claim the diverging levers, or clasps, when held and operated by the arrangement of springs and catches, as and for the purpose set forth.

71,203.—CAR COUPLING.—George R. Moore, Lyons, Iowa.
I claim the double hooks, or self-tightening clamps or claws, constructed as described, and pivoted in such a manner as to gripe the pin by the draught of the cars.

71,204.—FLUTINA-MELODEON.—Joseph Müller and Frederick Kaiser, Philadelphia, Pa.
We claim, 1st, The musical instrument herein described, adapted to be played either as a melodeon or as an accordeon, substantially as described.
2d, Supplying fresh air to the continuous current of air in the instrument through the holes, j, in the front of the upper part of the double chamber, B, substantially as described.
3d, The construction of the body of the flutina-melodeon with a lid, L, closing on the upper bellows, and lid, K, closing the keyboard, forming one side, and the bottom board, i', of the bellows, I, automatically closing the opposite side, whereby the body of the instrument is closed on all sides, and forms a portable case, substantially as described.
4th, The treadle, P, the detachable cord, M, and folding-stand, N, when combined and adapted for the purpose, substantially as described.

71,205.—PHOTOGRAPHIC APPARTUS.—Octave Nicour, Paris, France.
I claim, 1st, The apparatus or instrument as a whole, for photographing purposes, substantially as specified.
2d, The combination of lenses, C C C' C', of equal focal distance, and forming part of one and the same apparatus, and serving, the one set for finding the focus and the other for the production of the picture upon the prepared glass sheet or plate, substantially as specified.
3d, The combination of the lenses, C C C' C,' adjusting screw, D, tubes, B B', with their dark and light chambers, the one for holding the ground glass F, or its equivalent, for projection of the image, and the other provided with a slot or opening, c, for receiving the prepared glass sheet or plate, H, on which the picture is taken, essentially as herein set forth.
4th, In combination with the tubes, B B', and lenses as described, the adjusting screw, G.
5th, The combination with a photographing device, made up of tubes, lenses, and dark and light chambers, essentially as specified, of a box, I, constructed to hold the prepared glasses, sheets, or plates, and operating to insert the same in succession or at pleasure within the photographing chamber, and to receive the picture therefrom, without, during such transfer, exposure to the light, substantially as herein set forth, or in any other equivalent manner.

71,206.—ANIMAL TRAP.—Harrison Ogborn, Richmond, Ind.
I claim, 1st, The movable disk, G, operating in combination with the tilting bar, I, substantially as and for the purpose specified.
2d, In combination with the above, the pivoted platform, J, arm, K, connecting rod, L, lever, M, and door, F, arranged in relation to the apartments A and C, as and for the purposes explained.
3d, The retaining wires, P, substantially as and for the purposes described.

71,207.—WATER BOILER FOR COOKING STOVE.—Clement Olhaber (assignor to Woodrow, Mears & Co.), Cincinnati, Ohio.
I claim, 1st, The horizontally-flued reservoir, J, and extension plate, B, arranged, combined, and adapted to operate as set forth.
2d, The arrangement in a stove reservoir, of the bottom horizontal flue, E, communicating at the rear of the reservoir with a smoke-pipe collar, formed by the flanges, H and I, on the extension plate and reservoir respectively, as herein explained.

71,208.—ROTARY ENGINE.—Frederick Ortlieb, Williamsburg, assignor to the Metropolitan Rotary Engine Company, N. Y.
I claim, 1st, The combination, with a rotating piston made up of radial slides, and occupying an eccentric position relatively to the outer case, of separate inner and outer steam cylinders or chambers, when the one of said cylinders serves to use the steam expansively from the other in such manner as that the radial slides, which form a piston or pistons, common to both, are acted upon by high pressure steam at a short leverage, and by the expanded steam at a longer leverage, and lateral pressure on the main shaft, reduced or counteracted by the live or high pressure and expanded steam conjointly, substantially as specified.
2d, The arrangement, relatively to the inner and outer steam cylinders or chambers and rotating piston, common to both, of the several inlets and outlets for, without extra mechanism, and by the action of the radial slides composing the piston, the admission of high pressure steam to the inner cylinder or cylinders and passage therefrom, after performance of its duty, to the outer cylinder or chamber, to work expansively in the latter on said piston, and in due course discharge therefrom, essentially as herein set forth.
3d, The arrangement, substantially as herein described of the revolving piston, with its radial slides, inner and outer steam cylinders, and exhaust port in the outer cylinder to the condenser, for preventing the high pressure cylinder and greater portion of the low pressure one from being cooled by the condenser, essentially as specified.
4th, The steam balance plates, I and O, or I' O', the one of them (O or O') being stationary and connected with the outer cylinder, and the other (I or I') rotating with the piston, and both serving to pack the edges of the radial slides, and to relieve the piston of friction, essentially as herein set forth.
5th, In combination with the steam balance plates, O O', the packing rings, P P1 P2 P3, and recesses, m p, communicating with the high and low pressure cylinders of the engine, substantially as described.

71,209.—HAMES FASTENER.—Alonzo Palmer, Hudson, Mich.
I claim the bars, A B and C, and spring, D, constructed and arranged to operate in the manner and for the purposes set forth.

71,210.—COMPOSITION FOR COATING WOOD, IRON, PAPER, ETC.—Antonio Pelletier, Washington, D. C.
I claim, 1st, The compound consisting of vegetable fiber, silicate of soda, and soapstone, substantially as described, and for the purposes set forth.
2d, The compound consisting of vegetable fiber, soapstone, silicate of soda or its equivalent, when made into sheets or coated on fibrous, porous, or solid substances, and treated with coal tar and steatite, substantially as described and for the purposes set forth.
3d, As a new article of manufacture, the composition substantially as herein described and for the uses and purposes set forth.

71,211.—POCKET CUTLERY.—F. B. Perry, Northampton, Mass.
I claim the making of a knife in which the cheeks or sides of the handle through which the rivet is placed which holds the blade are united together by means of a bar secured to them in the manner and at the same position as above described.

71,212.—BALANCE WHEEL.—Elijah S. Pierce, Hartford, Conn.
I claim an improved balance wheel in which the outer rim or wheel is separate from the hub or axis, upon which it can turn when disconnected, and to which it is attached by the devices herein described, or their mechanical equivalents, for the purpose herein set forth.

71,213.—EMBOSSING CLOTH.—James E. Pollard (assignor to the Elliott Felting Mills), Franklin, Mass.
I claim the above described improved process of embossing and metalizing cloth or other material, such consisting in the employment of the gum, oil, and paste, or their equivalents, with the embossing plate and metalizing material under circumstances and in the manner, substantially as specified.

71,214.—HOTEL ANNUNCIATOR.—H. B. Porter, Chicago, Ill.
I claim, 1st, The sliding plates, B, provided with the projections, n and n', in combination with the front plate, A, the standards, D, and the horizontal rods, r, all arranged as and to operate in the manner substantially as specified.
2d, The combination and arrangement of the pivoted catches, i, and the plates, B, as and for the purposes set forth.
3d, The arrangement of the levers, l, in relation to the trip, k, substantially as represented, and to operate the same in the manner specified.

71,215.—AIR-TIGHT JAR.—Geo. M. Ramsay, New York city.
I claim contracting the inlet of a jar at three or more portions of its cross diameter, so as to hold the lid near the center, substantially as and for the purpose herein set forth.

71,216.—GLASS MOLD.—J. H. Reighard (assignor to J. H. Hobbs, Brockunier & Co.), Wheeling, W. Va.
I claim, 1st, Cooling the molds used in the manufacture of glassware, by means of water introduced into a chamber within the walls of the mold, substantially as above set forth.
2d, The use of the reservoir, K, pipe, L, spring valve, m, and arm, n, in combination with the mold, G, having the chamber, H, substantially as described.
3d, The use of the above described apparatus in combination with the press plate, P, having the guides, o o, substantially as and for the purpose set forth.

71,217.—BRAND FOR MARKING ANIMALS.—Frank H. Richards, Troy, N. Y.
I claim the stock or frame consisting of the several parts, the plate, a, the rib, b, the arch, d, and the handle, h, combined and forming a single piece, the hooks, m m, at the backs of the letters, and the double wedge, n, the whole constructed substantially in the manner and for the purpose above described.

71,218.—AIR PUMP.—Edward S. Ritchie, Brookline, Mass.
I claim the combination as well as the arrangement of the lever, F, the rod q, and the stuffing box, p, with the valve, o, the piston, B, and the barrel, A.
Also the application of the valve rod, q, to the valve, o, so as to be movable laterally relatively thereto, in manner substantially as and for the purpose described.
Also the combination and arrangement of the annular flap or auxiliary valve, w, with the valve, o, and its seat, k.
Also the combination of the prismatic guide, n, or its equivalent, with the valve, o, and the passage, l, and with the rod, q, applied to the valve, o, so as to be movable laterally therein, or with respect to it, as specified.

71,219.—TRUNK.—Samuel S. Ritter, Philadelphia, Pa.
I claim, 1st, As an article of manufacture, the trunk above described, having the end pieces, E E, clamped into the shape described and shown, and attached to the trunk by the rivets, r r, at a distance from the corners or angles of the trunk, so as to leave the latter perfectly smooth, substantially as and for the purpose specified.
2d, The process or method of constructing trunks, valises, &c., substantially as above described.

71,220.—BABY WALKER.—Joseph Rohr, Bat[illegible]
I claim a baby walker having platform, A, standard D, swinging bar, F, supporter, H, toy table, K, and rat[illegible]

scribed, all constructed and arranged substantially as and for the purposes herein specified.

71,221.—LAMP EXTINGUISHER.—Fred. Rohrer, San Francisco, Cal.

I claim a lamp extinguisher constructed and arranged substantially as described, as a new article of manufacture.

71,222.—CONSTRUCTION OF CONDUCTOR PIPES.—John C. Rohrman, Philadelphia, Pa.

I claim a waste water pipe having a longitudinal recess or groove, a, made substantially as described, by bending, lapping, and soldering the edges of the plates of which the pipe is composed, for the purpose specified.

71,223.—TRUNK.—E. A. G. Roulstone, Roxbury, Mass.

I claim the employment of leather or equivalent flexible material, having its surface formed into alternate parallel ribs and furrows, substantially as shown and described.

Also forming the metal corner of a bag or trunk frame, or molding, of separate pieces of angle metal, united as set forth.

Also attaching the strap to the trunk body by means of a loop, connected with and held by a fastening plate or projections within the trunk, substantially as set forth.

Also the manner of hanging the tray, substantially as shown and described.

71,224.—FIRE FENDER OR GUARD.—Charles H. S. Schultz, Cincinnati, Ohio.

I claim, 1st, The provision in a fire guard of the door or flap, B, as and for the purpose set forth.

2c, The arrangement of adjustable hooks, D, with the nuts, E, and clips, F, for the object explained.

71,225.—BED BOTTOM.—David A. Scott and Jonathan E. Burdge, Cincinnati, Ohio.

We claim passing the rods, E E, transversely through a series of longitudinal slats, a a, and under the arms, c c, of a like series of springs, for the purpose of securing the slats in their places, substantially and for the purpose set forth.

71,226.—CONSTRUCTION OF COAL SCUTTLES.—Joseph Scott, John Scott, and Wm. Miller, Brooklyn, N. Y.

We claim, 1st, A coal scuttle constructed as described, that is, by forming the joint between the body and bottom by flaring the bottom edge of the body outwardly, and turning or striking up a corresponding flange on the bottom plate, and then forming a bead with the two together, substantially as shown and described.

2d, In combination with the above joint, we claim the beaded upper edge of the base, C, for attachment in the manner specified.

3d, A coal scuttle constructed substantially as described, whereby the body and base may be packed in separate nests, to be connected at pleasure, as and for the purposes set forth.

71,227.—CROSS-CUT SAW.—Alfred M. Seabury, Johnstown, assignor to Charles W. Du Bois, Brooklyn, N. Y.

I claim a cross-cut saw formed with groups of diamond or scoring teeth, c c, and chisel teeth, d d, standing in one direction, and with notches between said groups of teeth, as and for the purposes specified.

71,228.—CARRIAGE TOP PROP.—Anson Searls, San Francisco, Cal.

I claim, 1st, The tubular joint bar standard, B.

2d, The clamp or claw, or equivalent.

3d, The screw bolt, C, that passes through the joint bar standard, B, and a part of the clamp, holding them firmly together and in position.

4th, The combination of the joint bar standard, B, with the clamp, A, in combination with the screw, C, for the purposes substantially as described.

71,229.—MANUFACTURE OF BRICKS, RETORTS, MUFFLES, CRUCIBLES, ETC.—Edward L. Seymour, New York city.

I claim the employment of pulverized emery in combination with any one or more of the materials aforenamed, for the purpose specified.

71,230.—MANUFACTURE OF CAST STEEL.—Edward L. Seymour, New York city.

I claim, 1st, The conversion of the non-magnetic peroxides and carbonates into magnetic oxides of iron, in the manner and for the purposes specified.

2d, The metallization of iron ores at a red heat, without fusion of the particles, and for the purposes stated.

3d, The fusion of the metallized matter as described and for the purposes explained in the specification.

71,231.—APPARATUS FOR MIXING MORTAR FOR MAKING BUILDING BLOCKS, ETC.—John Shelley, Harlem, N. Y.

I claim, 1st, The stationary hollow pipe, E, passing through the trunnions, b b, and extending longitudinally through the center of the cylinder, A, to which the water and steam pipes are both connected, the same being provided with holes or outlets on the under side, as herein described.

2d, In combination with the stationary pipe, E, the arms, i i i i, and scrapers or blades, I I, the revolving cylinder, A, operating in the manner as here in described, for the purpose set forth.

3d The arrangement of the water tanks, G G, the connecting water and steam pipes, H H, with their stop cocks, h h, placed at one or at both ends of the revolving cylinder, so that both steam and water may be alternately introduced into the mixture, substantially in the manner as herein set forth.

71,232.—KITE FRAME.—Josiah Shepard, New Britain, Conn.

I claim, 1st, A kite frame formed of ribs of tempered steel or metal wires, as set forth.

2d, The saddle piece, a, made in the manner as set forth, for receiving the wire ribs, as specified.

3d, The tips made with holes for the cord forming the border of the kite and with holes for receiving the ends of the ribs, as set forth.

71,233.—APPARATUS FOR MANUFACTURING GAS AND OIL FROM COAL.—John Shoemaker, Putneyville, Pa.

I claim, 1st, A retort for distilling bituminous coal, adapted for application to an ordinary stove, in combination with a rectifier, B, pipes, G and L, receiver, H, vessel, I, and condenser, K, arranged substantially as set forth.

2d, The combination and arrangement of the retort, A, safety valve, E, rectifier, D, constructed as described, with the pipe, G, receiver, H, vessels, I, condenser, K, worm, L, and connected branch pipes, substantially as and for the purpose set forth.

71,234.—PLOW.—Adam Shunk, Sr., Bucyrus, Ohio.

I claim, 1st, The construction of land sides of plows with flanges in the form herein described, and for the purposes herein mentioned.

2d, The construction of plow colters with an inward curve above that part which cleaves the ground, in the form herein described and for the purposes herein mentioned.

71,235.—KEY-HOLE GUARD FOR DOOR LOCKS.—Simon Shloss, Florence Veerkam, and Chas. F. Leopold, Philadelphia Pa.

We claim, 1st, A case, A, with its projection, a, cap, B, segmental plate, D, and piece, d, the whole being constructed for attachment to a lock, and for operating substantially as and for the purpose herein set forth.

2d, The combination of the shoulders or stops, e and f, of the case, A, with the lugs, l an l', of the cap, B, for the purpose specified.

3d, The combination, substantially as described, of the cap, B, and its lugs, l and l', with the segmental plate, D, for the purpose herein set forth.

4th, The lugs, l and l', of the cap, B, for guiding the key, F, as set forth.

71,236.—COFFEE-POT.—J. B. Smith, Milwaukee, Wis.

I claim a coffee-pot, consisting of the inner vessel, B, and the outer vessel, A, with a water space between them, united at their top by an annular plate, having an opening, G, at the rear side only for the introduction of water, substantially as described.

71,237.—COFFEE-POT.—J. B. Smith, Milwaukee, Wis.

I claim, 1st, Shield, H, in combination with double coffee-pot, A and B, and handle, F, substantially as and for the purpose described.

2d, Double coffee-pot, A and B, with opening, G, shield, H, and covers, C and E, combined and arranged as described.

71,238.—BROOM HEAD.—Levi S. Smith (assignor to himself and Joseph V. Winemiller), Gorsuch's Mills, Md.

I claim the cap or socket, A, in combination with the links, G G, cross head, H, and screw, B, substantially as described for the purpose set forth.

And, in combination with the links, the clamping blocks and screws.

71,239.—SEALING FRUIT CANS.—Charles F. Spencer, Rochester, N. Y.

I claim the combination of the lead or equivalent seal with the countersunk or depressed seat, as and for the purpose set forth.

71,240.—VEHICLES.—Stephen J. Spencer, Yorkshire, N. Y.

I claim plates, D D, secured to the bottom of the box or body, and the rods, E E, connected to the upper portion of the springs, when used substantially as and for the purpose set forth.

71,241.—CAR AXLE BOX.—T. B. Stewart, Wethersfield, Conn.

I claim, 1st, The combination of the tubes, B and C, with flanges, a and b, arranged upon the box and wheel, substantially as herein shown.

2d, The crescent-shaped saddles, f, having tenons, g g g, upon their outer surfaces, and cavities, h h h, on their inner surfaces, arranged substantially as shown.

71,242.—LAMP.—Cornelius St. John, Charlestown, Mass.

I claim the combination, with the base and wick tube of a lamp burner, of the cylindrical chimney-rest and supporter, A, of wood, or other suitable material which is a non-conductor of heat, substantially in the manner and for the purpose herein shown and specified.

Also, the combination, with the wick tube and base of the burner, of the chimney-rest, A, deflector, e, and perforated plates, by which said chimney-rest and deflector are supported and held in position with relation to the wick tube, substantially as herein shown and set forth.

Also, the adjustable spring, applied to the side of the burner, for sustaining the chimney in place, essentially as set forth.

Also, the peculiar arrangement and application of the wick elevating shafts, i k, essentially as herein shown and described, and productive of advantages as explained.

71,243.—MACHINE FOR HEADING BOLTS.—Wilber Swathel (assignor to W. J. Clark, H. H. Clark, and C. H. Clark), Southington, Conn.

I claim, 1st, In bolt machines, the two independent clappers, G and L, and the two separate projections, B1 B2, on the shaft, B, and the wedge piece, E, arranged as represented, so as to operate relatively to each other and to the header and moving die, substantially as and for the purposes herein set forth.

2d, Holding the header and slide, K, forward, while the clapper, L, rises, by the catch, M, or its equivalent, arranged and operating substantially in the manner and for the purpose herein specified.

71,244.—AIR HEATING FURNACE.—John M. Thatcher, Bergen, N. J.

I claim, 1st, In combination with the fire-pot, a central feeding funnel, in the form of two hollow frustra, of cones, united together at their smallest ends, substantially as described.

2d, The clinker cleaning passage, from and through the furnace front, to and into the fire-pot, inclosed by the plate connected with the fire-pot, furnace front, and ash pit, so as to prevent communication with the hot air chamber, surrounding the fire-pot, substantially as described.

3d, In combination with the clinker cleaning passage, the downward passage leading therefrom to the ash pit, substantially as described.

4th, In combination with the ash pit, grate, and downward passage, leading from the clinker cleaning passage-way, and sifting drawer, having a perforated bottom, extending forward of the grate bars, and [illegible] underneath said downward passage, substantially as described.

5th, The sliding dead plate or front bearer to the grate, in combination with the grate and downward passage, substantially as described.

6th, The combination of the corrugated bottom plate of the flue passage from the fire-pot to the chimney, with the air heating tubes which pass through said passage, which tubes are arranged in rows, and joined to the corrugated plate upon the ridges or V-parts of said plate, which project up into the flue passage, whereby the ashes or other solid matter coming from the fire-pot is prevented from accumulating between the tubes of each row, and forced to accumulate in the grooves or depressed portion of the corrugated bottom plate, between the several rows of tubes, thus affording facility for cleaning the bottom plate and increasing the heating surface, substantially as described.

7th, In combination with the flue passage, p, and vertical air heating tubes, the cleaning passage, leading from the rear of said flue passage, of the full width thereof, to and through the rear wall surrounding the furnace, substantially as and for the purposes described.

8th, The combination of the flue passage, increasing in depth, with air heating tubes increasing in length, in proportion to their distance from the fire-pot, whereby greater tubular air heating surface is obtained to compensate for diminished heat, substantially as described.

9th, In combination with the flue passage and vertical air heating tubes, the two connecting flues which connect said flue passage with the main flue, leading from the chimney, said two flues connecting with the flue passage on opposite sides, and near the bottom thereof, substantially as described.

71,245.—ORGAN BELLOWS.—Elihu H, Thomas, Jr. (assignor to J. Estey & Co.), Brattleboro, Vt.

I claim the combination and arrangement of the sector and its hinge, with the strap, the pedal, the bellows, and its operative spring, the whole being substantially as specified.

71,246.—ABDOMINAL SUPPORTER.—Jared Thompson, Milwaukee, Wis.

I claim the adjustable pads, h h, attached to the bar, g, substantially in the manner described and for the purpose set forth.

The abdominal pad, e, provided with the loop, l, and its set-screw, d, the the supporting wire, c, provided with a spring case, b, and the pessary, a, when constructed and arranged as set forth.

I also claim the attaching to the bar above described, two springs, for the purpose and in the manner substantially as above set forth.

71,247.—CAR WHEEL.—Samuel A. Traugh (assignor to himself and Jeptha Garrard), Cincinnati, Ohio.

I claim a cast-wheel, whose web is composed of the undulating scrolls or convolutions, A, formed and arranged as and for the purpose described.

71,248.—LAMP.—Charles N. Tyler, Buffalo, N. Y.

I claim, 1st, The combination wick, W X, consisting of a supply wick, combined with two or more combustion wicks, by means of a braided or other covering, substantially as and for the purposes set forth.

2d, The wick tube, A, when flared and grooved, and provided with openings, o, substantially as and for the purposes set forth.

3d, The combination of the wick, W X, and the wick tube, A, substantially as and for the purposes set forth.

4th, Arranging the combination wick so as to leave a space, s, between the top of the supply wick and the top of the burner, substantially as described.

71,249.—SNOW PLOW.—Peter Vonlackum, Elba, Minn.

I claim, 1st, The snow plow, consisting of the front incline, C, the double concave wings, D, and the cutting bars, a, b, and d, all constructed and arranged to operate as and for the purpose set forth.

2d, The wheels, E, when provided with the corrugated flange, as herein shown and described.

71,250.—HAY LOADER.—Albert Vose, Pittsfield, Vt.

I claim, 1st, The combination of the sliding shaft, a, and spring, g, substantially as and for the purposes set forth.

2d, Also, the combination of the sliding shaft, a, provided with a toothed segment, u, cogged wheel, A, spring, g, and lever, f, substantially as and for the purposes set forth.

3d, Also, the lifting arm, h, or its equivalent, when the same is adjustable laterally, substantially as and for the purpose set forth.

4th, Also, the lifting arm, h, pivoted to the elevating shaft, a, substantially as and for the purpose set forth.

5th, Also, the combination of the pivoted lifting-arm, h, pivoted brace, l, and shaft, a, substantially as and for the purpose set forth.

6th, Also, the combination of the shaft, a, arm, x, and cord, w, substantially as and for the purposes set forth.

7th, Also, the combination of the lifting-arm, h, or its equivalent, and an elevated fork, n, pivoted thereto, substantially as and for the purpose set forth.

8th, Also, a combination of a laterally adjustable lifting-arm, h, and an elevated fork, n, pivoted thereto, substantially as and for the purposes set forth.

9th, Also, the combination of a laterally adjustable lifting-arm, h, and a vertically adjusting arm, i, attached thereto, and supporting the fork, n, substantially as and for the purposes set forth.

10th, Also, an elevating fork, n, as connected to its lifting-arm, h, that it may be readily detached therefrom, for the purpose of unloading the hay, substantially as described.

11th, Also, the combination of the forked arm, 5, block or plate, o, and nuts, 7, 7, substantially as and for the purpose set forth.

12th, Also, the combination of the notched sliding bar, r, tines, n, guides and pawl, s, substantially as described.

13th, Also, the automatic griping device, v, consisting of the arm, v, on the lifting-arm, h, and the pivoted pawl-lever, s, on the pivoted fork, n arranged and operated substantially as described.

71,251.—WATER GRATE FOR FURNACES.—Robert L. Walker, Globe Village, Mass.

I claim a water grate, made with the passage into and through its middle bar, and with the two serpentine passages, a a, leading from one end of such bar in opposite directions, and through the other bars, as specified.

Also, a water grate, as made not only with the passage into and through its middle bar, and with two serpentine passages, a a, leading from one end of such bar in opposite directions, through the other bars, but with a common transverse passage, e, provided with a discharge opening, f, as described.

71,252.—ENVELOPE MACHINE.—Thomas V. Waymoth, New York city.

I claim, 1st, Attaching the wing used for folding the seal flap of envelopes to the machine or frame at a lower level than the upper surface of the bottom of the folding press, for the purpose set forth.

2d, So arranging the front wing, a, called the seal-flap wing, in combination with folding press, by means of the adjustable stop, f, or any suitable device, that such wing can be turned upon the press at different angles, or can stand vertically, as desired.

3d, The arrangement and combination, substantially as described, with the plunger, B, and folding press, C, of the projecting lines, m n, and grooves, l o, for the purpose set forth.

4th, The combination with the plunger, B, and folding-press, C, substantially as described, of the roughened surface, p, and yielding cushion, q, for the purposes set forth.

71,253.—GRATE.—Marshall D. Wellman, Allegheny City, Pa.

I claim the agitators, C C, constructed as described, and secured between the spaces in the grate, B, with its projections, e e, the whole being constructed and operating in the manner substantially as and for the purposes specified.

71,254.—TRUNK HINGE.—Lucius Wheaton, Auburn, N. Y.

I claim the upper part, A, provided with slot, e, in combination with lower part, B, when both are constructed and hinged, substantially in the manner specified.

71,255.—HARVESTER.—Wm. N. Whiteley, Springfield, O.

I claim, 1st, A projecting stop-pin, H, or its equivalent, on the pitman, which, when folding the cutter-bar, will come in contact with a stationary part of the guide-bar or shoe, and prevent the knife from running out of the shoe, as set forth.

2d, A plate, J, secured at one end to the pitman, and placed between the under and jam-nuts on a clamping bolt, as and for the purposes described and set forth.

3d, In combination with the pitman, A, of a harvesting machine, the solid ring head, L, as and for the purpose described.

71,256.—MANUFACTURE OF PHOSPHATE OF SODA AND OTHER PRODUCTS.—Charles P. Williams (assignor to himself and George T. Lewis), Philadelphia, Pa.

I claim the art or manufacture of the phosphate of soda and other phosphates by the process or method herein shown and described.

71,257.—HARVESTER GUARD FINGER.—William A. Wood, Hoosick Falls, N. Y.

I claim, 1st, Inserting in the main body of a guard finger for a harvesting machine a piece of metal, harder than the main body of the guard-finger, when the piece so inserted shall form the enteing guard cap, and also a complete lining to the cutting cavity through which the cutters vibrate.

2d, Constructing a guard finger with lips, h h, in combination with the hardened piece, B, or their equivalents, substantially as and for the purpose set forth.

71,258.—SLEEPING CAR.—Jonah Woodruff, Pittsburgh, Pa.

I claim, 1st, A double couch or berth for the upper tier in a sleeping car, consisting of two leaves so hinged together that the outer leaf folds upward, and the inner leaf, being attached to the side of the car by hangers, c c, so that the couch thus formed may be folded and swung up toward the roof of the car, substantially as hereinbefore described.

2d, A detached and removable partition, m, when so constructed as to divide the space occupied by the berths of a sleeping car into separate compartments at night, and to be removable by day so as to permit the free passage of air through the car, substantially as and for the purposes hereinbefore set forth.

71,259.—MACHINE FOR CUTTING AND PUNCHING FLYNET STRAPS.—Josiah Yeager, Berrysburg, Pa.

I claim, 1st, The construction of the knives or cutters, e, with the inclined cutting edge, substantially as described.

2d, The adjustment of the cutter bit or stock, by means of the lever, as described.

3d, The manner of securing the knives and spacing keys by means of set screws and wedges, as described.

4th, The two punches, f f, arranged in the bit or stock, and secured therein by set screw, as described, for punching the holes in the strap in pairs, as set forth.

5th, The metal bed plate, F, adapted to receive the perforated guides for various sized straps, substantially as and for the purpose set forth.

71,260.—GRATE, FIREPLACE, AND FURNACE.—Wm. Young, London, England.

I claim the application to grates, fireplaces, and furnaces, of spiral bars, adapted for the double purpose of feeding and raising the fuel to the fire, and admitting air to the fuel, as described.

REISSUES.

2,799.—ELEVATED RAILWAY.—P. Andrew, Cincinnati, Ohio.

I claim, 1st The construction and arrangement of a quadruple track upon a single row of pillars, provided with cross arms for suspending and supporting the track, substantially as set forth.

2d, Also, the arrangement of the guide rails, E E, to obviate the necessity of using flanges on the car wheels, and to prevent the cars being thrown from the track, in the manner and for the purpose herein set forth.

3d, Also, the arrangement and combination of bars, K and L, fulcrum-piece M', connecting rod, M, for holding propelling rope firmly against groove of wheel.

4th, Also, a succession of endless ropes for propelling street cars.

5th, Also, the combination gear apparatus, O P Q Q' Q'', as described, for attaching and detaching cars from the propelling ropes.

6th, The arrangement and combination of wheel, S, and band, T, as described and for the purposes set forth.

7th, Also, supporting the rails of the track by means of truss rods, X, substantially as set forth, but I do not claim the truss rods except as a support for the rails of an elevated railway.

2,800.—HARVESTER RAKE.—Chas. F. Davis, Auburn, N. Y.

I claim the combination of a stop lever, L, controlled by the driver, with the hinged rake head, and so arranged that the driver can, at pleasure, by moving the stop lever out or in, change the heads from rakes to beaters, and from beaters to rakes, for the purpose of controlling the size of the gavels, substantially as set forth.

Also, in combination with the rake head of a combined rake and reel that is thrown out of action by the operator riding on the machine, a mechanism by which it is automatically thrown again into action, substantially as described and represented.

2,801.—SEALING PRESERVE CANS.—Henry S. Fisher, Newburg, Pa.

I claim, 1st, A self-adhesive seal which is prepared either in the form of a sheet, ring, disk, or piece of any required size or shape, and composed of paper which is thoroughly saturated and coated on its surface with a cement composed of the within-described substances, or the respective equivalents thereof, substantially as described and for the purpose specified.

2d, A self-adhesive seal, which is composed of paper thoroughly saturated and coated with a rosin cement, and afterward subjected to considerable pressure, so as to adapt the seal for hermetically closing preserving vessels, substantially as described.

3d, A seal which is composed of paper and cement, in combination with a compressing and retaining device, C, or its equivalent, substantially as and for the purposes described.

2,802.—STUMP EXTRACTOR.—Isaac Hicks, Hartford, Wis.

I claim, 1st, Shaft, B, pulley, C, bar, E, with its hanging fulcrum, ropes, or chains, D D, strap, F, and band, I, in combination, substantially as described.

2d, Frames, J, and wheels, o, in combination, substantially as described.

2,803.—MACHINE FOR CUTTING PAPER.—Hervey Law, Chatham, N. J.

I claim the combination of the rising and falling platform, C, and clamp frame, E, operating to clamp the paper or book as the platform rises, and to unclamp the same as the platform descends, by means of single or double cams or toggles, F F, having cranks, G G, connected with them, the pintles of which work in curved grooves, or otherwise actuated by any well-known and mechanical device, substantially as and for the purpose herein shown and described.

2,804.—HAND TRUCK.—P. H. Humes, Watson's Salt Creek, Ill., assignor to William C. Rentgen, Keokuk, Iowa.

I claim the curved parts or ends, a a, of the truck, with or without the auxiliary wheels, b b, in combination with the curved removable holding and stop bar, D, made either of a single piece or divided at its extremity, substantially as and for the purpose set forth.

DESIGNS.

2,831.—PRINTER'S TYPE.—David Bruce, Brooklyn, assignor to David Wolfe Bruce, New York city.

2,832.—PRINTEER'S TYPE.—Julius Herriet (assignor to David Wolfe Bruce), New York city.

2,833.—ORNAMENTAL TYPE.—Edwin Charles Ruthven, Philadelphia, Pa.

2,834.—TRDE MARK.—Joseph Scholfield, Constantine, Mich.

2,835.—SATCHEL.—R. M. Seldis, New York city.

2,836.—SEWING MACHINE.—W. G. Wilson, Cleveland, Ohio.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

21,576.—LAMP.—Rufus Spaulding Merrill and William Carleton, Boston, Mass., assignees of Christian Reichmann, Philadelphia, Pa., ated Sept. 21, 1858. Application for reissue received and filed Oct. 11, 1867.

1st, We claim a lamp burner in which the parts are arranged substantially as described so as to allow the light to pass out or be reflected from beneath or from the under side of dome or reflector, substantially as set forth.

2d, A lamp burner in which the deflector and other parts contiguous to or adjoining the flame are raised above and removed from contact with the base of the burner, substantially as and for the purposes herein specified.

3d, In combination with the lamp the slotted open dome or deflector when so constructed, arranged and operating as to allow the light to be deflected downward, substantially in the manner and for the purpose herein set forth and explained.

4th, The combination of the deflector and other parts surrounding the upper end of the wick tube with a sliding or adjustable sleeve mounted upon said tube under such an arrangement that the said sleeve and the deflector and other parts which it carries may be readily removed from or applied to the wick tube, as and for the purposes set forth.

5th, A deflector or dome constructed as herein described, that is to say, provided at its base with a series of peripheral springs for steadying and supporting the lamp chimney, substantially as set forth.

6th, The combination with the dome or deflector of a series of arms projecting from the periphery of said deflector and arranged as herein described so as to constitute both the seat or rest for the lamp chimney and the springs by which the said chimney is steadied and held in position, substantially as set forth.

66,498.—FIRE ANNIHILATOR.—Charles T. Jerome, Minneapolis, Minn. Dated July 9, 1867. Application for reissue received and filed Nov. 7, 1867.

1st, I claim the application of a quick match, or its equivalent, which will take fire at a low temperature to an apparatus for extinguishing fires by the infection upon the same of a gaseous or a liquid non-supporter of combustion, substantially as described.

2d, Preparing the ends of the quick matches with a composition composed of the within-described ingredients mixed together in about the proportions set forth.

45,389.—HEATING APPARATUS.—Thomas S. Clogston, Boston, Mass. Dated Dec. 13, 1864. Application for reissue received and filed Oct. 31, 1867.

I claim the application and use for heating purposes of one or more tubes having a corregated or annular ribbed surface in combination with a boiler or other suitable steam generator and pipes for conducting the steam or hot water from said generator to the corrugated tubes, essentially as herein shown and described.

18,175.—TYPE SETTING AND DISTRIBUTING MACHINE.—The Alden Type Setting and Distributing Company (assignees by mesne assignments of Timothy Alden), New York city. Dated Sept. 15, 1857. Application for reissue received and filed Nov. 8, 1867.

1st, We claim the revolving carrier wheel, J, provided with suitable conveyors or gripping devices capable of taking hold of a type and carrying the same from one channel to another, substantially as set forth.

2d, The method substantially as described for conveying the type to and from the type cases and the composing and setting tables consisting of a type carrier in combination with a series of conveyors which are capable of receiving any type indiscriminately and also of receiving an indication representing the type so received or that required whereby that type may be deposited into or taken from the type cases, substantially as set forth.

3d, The ring, f4, supported by suitable bearers or friction rollers in combination with the carrier wheel, J, and stationary shaft, k9, substantially as and for the purposes described.

4th, The herein-described or any equivalent method of attaching the conveyors to the carrier wheel by which they are permitted to stop while delivering or receiving type without arresting the motion of said carrier, substantially as set forth.

5th, Giving to the gripping end of the conveyer a motion from and toward the center of the carrier wheel whereby said gripping end is made to closely approach the place at which the conveyer is to receive or deposit a type for the purposes and in the manner substantially as described.

6th, The mechanism for gripping the type consisting of the projection or lip, g5, and bolt, o, substantially as set forth.

7th, The foot, g5, on the conveyers for supporting the type, substantially as described.

8th, The cam, u5, and lever, t5, whereby the gripping bolt, o, is withdrawn and made to release the type, substantially as described.

9th, The latch, v5, and notch, x5, in the bolt, o, to retain said bolt open, substantially as set forth.

10th, The pin, y6, on the carrying wheel to throw back the latch and release the bolt, o, substantially as described.

11th, The pusher, b6, on the conveyer to discharge the type from the grippers, substantially as set forth.

12th, The cam, d6, on the carrier wheel, J, to give motion to the pusher, b6, on the conveyers, substantially as described.

13th, The lever, u6, secured to a stationary fulcrum to give motion to the pusher, z5, of the setting conveyers, substantially as set forth.

14, The springs, l5, having the double function of thrusting the conveyers out and forcing them in, substantially as described.

15, The projecting piece, g6, on the conveyers and the stationary hooks, x, for the purpose of arresting the conveyors at proper places, substantially as set forth.

16th, The adjustable indicator points, o5, on the conveyers, substantially as and for the purpose described.

17th, The bar, n6, cams, j6, and spring, o6, for carrying the conveyers to the forward ends of their slots, substantially as described.

18th, The type cases or channels, K, arranged both to receive type from and discharge it to the conveyers, substantially as described.

19th, In combination with the devices or mechanism for receiving the types into and for delivering them from the type cases, we claim arranging the types edgewise in said cases whereby for all the types of a font an uniform throw or action may be given to said mechanism.

20th, In combination with the type channels or cases the mechanism for pushing out the type consisting of the rack, pendulum lever, and propelling rod, and the pusher upon the conveyers, or any equivalent thereof, as described.

21st, In combination with the type channels the mechanism for preventing the stopping of a setting conveyor at a type channel when it is empty or a distributing conveyer at a channel when full of type consisting of the tilting bar, s7, the pendulum lever and rack, or equivalents, as described.

23d, The rim, m7, to lift the pawl, n7, clear of the ratchet, l7, substantially as set forth.

23d. The excavated ring, m5, in combination with the conveyers and type channels, substantially as and for the purpose described.

24th, The stationary inclined pieces, g7, in combination with the grooves of the ring, m5, for restoring the indicating points upon the conveyer to a zero or starting point, as set forth.

25th, The movable indicators, e7, in combination with the grooves in the ring, m5, and with the shifting bars of the distributing mechanism, substantially as described.

26th, The channel of excess, Q, in addition to the regular type cases, k, and in combination with the conveyers, d, substantially as and for the purpose set forth.

27, The latch, j8, and pusher, b8, in combination with the channel, Q, substantially as and for the purpose described.

28th, The mechanism for feeding up the line of type consisting of the cam, w2, spring, x2, arm, a2, and disk, g2, substantially as set forth.

29th, The mechanism for feeding up the column of type and for elevating the successive lines thereof into the channel, substantially as described.

30th, The method of engaging and disengaging the feeding pawls consisting of the hanging lever, a3, in combination with the frame, H, with the means for depressing the bolt, d3, and with the ratchet having the engaging and disengaging wedges, as described.

31st, The movable plate, d2, in the channel, a, to allow of raising the top line free of obstruction, substantially as set forth.

32d, The arrangement of type levers to act on the nicked edges of the type and produce the required set in the machine, substantially as and for the purpose described.

33d, The combination of the type levers, z3, with the distributing conveyers, substantially as and for the purpose set forth.

34th, The movable frame, y3, carrying the type levers, z3, in combination with the graduated stop, c4, substantially as and for the purpose described.

35th, The lever, l4, and apron, g4, to regulate the throw of the frame, y3, for the "thin space," substantially as set forth.

36th, The hammer, a5, to keep the type down on the bottom of the channel, a, and insure a correct operation of the levers, z5, substantially as described.

37th, The forked discharge piece, k4, to push the type off squarely upon the conveyor, substantially as set forth.

38th, The bell crank lever, c4, and pin, l4, for relieving the frame, y3, substantially as described.

39th, The arrangement of mechanism for transmitting the movements produced upon the levers, z3, by the nicks in the type and for effecting the proper combinations upon the indicators, e7, consisting of the detaining levers, n4, the bars, p4 bar, t4, bars, r4, bar, y4, and the connecting levers, g4, together with the operating cams upon the shaft, j4, or any equivalent combination, whereby the same results will be produced, as described.

40th, The follower, c10, and gage, f10, in combination with the channel, f, and galley, M, substantially as and for the purpose set forth.

41st, In combination with the keys the arrangement of mechanism whereby the separate different signals represented by each of a great number of keys may be produced by a less number of indicators, as described.

42d, The independent registering apparatus constructed as described, or its equivalent apparatus, which will effect the recording of the letters or signs as indicated by the keys independently of the type carrying apparatus, substantially as set forth.

43d, The pins, c9, placed in the rings, H9 R, of the register wheel, substantially as and for the purpose described.

44th, The stationary cam, s10, for returning the pins, o9, substantially as set forth

45th, The radiating revolving levers, h9, in combination with the register wheel and with the keys, substantially as described.

46th, The mechanism for transmitting the indications from the register consisting of the detaining levers, k9, in combination with the setting indicators and with the register, substantially as described.

47th, The springs, g9 j9, and lever, i9, in combination with the indicator bars, f9, and with the register and carrier wheel whereby the indicator bars are caused to act on the setting conveyors and immediately thereafter made to retreat previous to the passage of a distributing conveyer, substantially as set forth.

48th, The toe, c9, in combination with the radiating revolving frame, j9, stop pawl, d9, and register wheel, R, substantially as and for the purpose described.

28,105.—BASKET.—The American Basket Company, New Britain, Conn., assignees by mesne assignments of Jesse K. Park, Marlboro, N. Y. Dated May 1, 1860. Application for reissue received and filed Oct. 31, 1867.

I claim the construction of the uprights for the sides of a basket and the bottom thereof of thin laminae of wood secured crosswise and flatwise to each other without interweaving so that there are two thicknesses of the material in the bottom and a single thickness in the uprights, substantially as before set forth.

Also the combination of the said laminae attached crosswise and flatwise without interweaving with a connection at their ends, substantially as before set forth.

Also the combination of the said laminae (attached crosswise and flatwise without interweaving), with a connection at their ends and with filling inserted between the bottom and the ends of the uprights, substantially as before set forth.

Also the compound metal and wood basket rim with the wood at interior, substantially as before set forth.

39,582.—COAL STOVE.—Dennis G. Littlefied, Albany, N. Y

Dated Aug. 18, 1863. Reissue No, 1894. Dated Dec. 22, 1863. Application for reissue received and filed Nov. 11, 1867.

1st, I claim the peculiar mode and manner described of constructing the magazine consisting as it does of several parts so connected together as to combine strength, durability and perfect adaptation to their purpose and so adjusted as conveniently to admit of separation and reunion at pleasure.

2d, The devices described by means of which the several sections and segments of the magazine are held firmly together in their relative positions and the whole in its proper place.

3d, The devices described by means of which the lining of soapstone or bricks is held securely in its proper place notwithstanding the greater expansion of the iron cylinder by heat and by means of which it is protected from injury by the descending coal.

4th, The magazine constructed as described in combination with the furnace separated from it and suspended within a chamber isolated from the chamber surrounding the magazine.

5th, The combination of a magazine contracting in diameter from the middle or other line downward to its lower end with a furnace suspended within a chamber isolated from the chamber surrounding the magazine.

6th, The devices described by means of which the upper and lower sections of the burner can readily be separated and re-united without injury to either.

7th, I claim the inter-communication to be opened and closed at pleasure between the chamber of a magazine coal burner which surrounds the furnace and that which surrounds the magazine.

66,318.—GLOBE VALVE FOR STEAM ENGINES.—Joseph J. French and Reuben A. McCauley, Baltimore, Md., assignees of Joseph J. French aforesaid. Dated July 2, 1867. Application for reissue received and filed Oct. 5, 1867.

1st, I claim the solid arch, H, or its equivalent, bracket, H', in combination with and carrying the hollow screw, B, as and for the purpose set forth.

2d, The square projection, J, of the valve stem, D, made and combined substantially as and for the purpose shown and set forth.

3d, The hollow plug, F, having a screw, e, on it when combined with the arch, H, hollow screw, B, shaft, D, and body of the valve, A, as and for the purpose shown and set forth.

4th, The combination of the solid arch, H, hollow screw, B, valve shaft, D, plug, F, and body of a globe valve, A, made and arranged substantially as shown and set forth.

58,494.—GRATE BAR.—Sterry Smith, Salem, Mass. Dated Oct. 2, 1866. Application for reissue received and filed Nov. 11, 1867.

I claim a compound grate bar formed of a series of parallel longitudinal bars, H H' G G" G'", constructed and connected together, substantially as described.

57,337.—HORSE HAY FORK.—Mary Jane Laird, Middletown, Pa., (administratrix of the estate of Andrew Laird, deceased). Dated Aug. 21, 1866. Application for reissue received and filed Nov. 12, 1867.

1st, I claim the tines, D D, having cutting eyes, 2 2, substantially as and for the purpose specified.

2d, I claim the tines, D D, having slots, d' d', so arranged that when they are operated upon by a lever or other device they will be compelled to travel so as to form the area of a circle, substantially as and for the purpose specified.

3d, I claim the tines, D D, in combination with the rod, C, having pins or pivots, d d, when the same are constructed and arranged so as to operate substantially as described.

4th, I claim the tines, D D, in combination with the rod, C, when the former are pivoted to the parallel bars, A A, and work in slots arranged in the end of the same, substantially as described and for the purpose specified.

5th, I claim the rod, C, link, E, and lever, F, when the same are arranged and combined substantially as described.

6th, The bars, A A, when they are connected and arranged as shown in combination with the rod, C, and link, E, substantially as described.

7th, In combination with the sliding rod, C, the lever, F, having its upper horizontal arm adapted to project through the ring, H, substantially as described and for the purpose specified.

68,095.—THRASHING MACHINE AND SEPARATOR.—Hugh W. Matthews, Chicago, Ill. Dated Aug. 27, 1867. Application for reissue received and filed Nov. 12, 1867.

1st, I claim a longitudinally slatted grain rack or platform, C, constructed substantially as described in combination with vertically and longitudinally moving shakers, D, arranged so as to play between the slats of said rack, substantially as described.

2d, The combination of a thrashing device, a perforated and longitudinally slatted stationary rack, C, and blades or straw shakers, D, operating substantially as described.

3d, A stationary or movable rack, C, composed of perforated slats having longitudinal spaces between them in combination with serrated blades, D, arranged and operated substantially as described.

4th, The slatted and perforated grain rack arranged so as to incline toward the thrashing device and hinged to the main box or frame, A, substantially as described.

5th, A centrally arranged longitudinal trough, J, provided with a screw conveyor, K, and two inclined planes, h h, substantially as described.

6th, The combination of a slatted rack or grain platform, C, the serrated grain or straw shakers operating through said grain rack and conveyor, arranged and operating substantially as described.

4,472.—MACHINERY FOR MAKING HAT BODIES.—Eliza Wells, Brooklyn, N. Y., administratrix of the estate of Henry A. Wells, deceased. Dated April 25, 1846. Reissue No, 396. Dated Sept. 30, 1856. Extended April 25, 1860. Reissue No, 1,087. Dated Dec. 4, 1860. Application for reissue received and filed Nov. 13, 1867.

1st, I claim the combination of the rotating brush or picker, substantially such as described, the rotating pervious cone provided with an exhausting mechanism substantially as described and the bottom plate or guide substantially as described for directing the fur fibers toward the lower part of the cone and preventing the fibers going to waste the said combination having the mode of operating specified and for the purpose set forth.

2d, The combination of the rotating brush or picker substantially as described the rotating pervious cone provided with an exhausting mechanism substantially as described and the guide or deflector for directing the fur fibers on to the tip and upper part of the cone substantially as described, the said combination having the mode of operation specified and for the purpose set forth.

3d, The combination of the rotating brush or picker, substantially as described, the rotating pervious cone provided with an exhausting mechanism substantially as described and the side guides or either of them substantially as described to prevent the fur fibers from getting out of the proper influence of the currents travelling to the cone and to protect the traveling fibers from disturbing currents, the said combination having the mode of operation specified and for the purposes set forth.

4th, The combination of the feeding apron on which the fur can be placed in separate batches as described the rotating brush or picker substantially as described the rotating pervious cone or former provided with an exhausting mechanism substantially as described, the said combination having a mode of operation substantially such as described.

5th, The combination of the feed apron on which the fur fibers can be placed in separate batches each in quantity sufficient to make one hat body the rotating brush or picker substantially as described the rotating pervious cone provided with an exhausting mechanism and the means for guiding the fur fibers substantially as described, the combination having the mode of operation specified and for the purpose set forth.

6th, The combination of the rotating brush or picker substantially as described the rotating pervious cone or former provided with an exhausting mechanism, substantially as described, and the flexible cloth, or the equivalent thereof, by means of which the cone with the bat of fur fibers can be safely removed from the machine, substantially as described.

7th, In combination with the pervious cone provided with an exhausting mechanism, substantially as described the covering cloth wet with hot water, substantially as and for the purpose specified.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,890.—APPARATUS FOR SUPERHEATING STEAM AND OTHER VAPORS.—Leffert R. Cornell, New York city. Oct. 15, 1867.

2,896.—CONSTRUCTION OF RAILWAYS AND RAILWAY CARRIAGES, AND MEANS FOR PROPELLING THE SAME.—Chas. T. Harvey, Tarrytown, N. Y. Oct. 15, 1867.

2,941.—BREECH LOADING FIRE-ARM.—Samuel Norris, Springfield, Mass. Oct, 19, 1867.

2,971.—DREDGING AND SPICE BOXES.—George W. Putnam, Peterborough N. Y. Oct. 22, 1867.

2,981.—SINKING OR FORMING WELLS, AND APPARATUS TO BE USED.—Stephen Brewer, Cortland, N. Y. Oct. 23, 1867.

3,041.—CENTRIFUGAL MACHINE FOR SEPARATING LIQUID FROM SOLID MATTER.—David McC. Weston, Boston, Mass. Oct. 28, 1867.

EXTENSION NOTICES.

James Pitts, of Clinton, Mass., having petitioned for the extension of a patent granted to him the 28th day of February, 1854, for an improvement in cotton picker cylinders, for seven years from the expiration of said patent, which takes place on the 28th day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 10th day of February next.

George W. Coats and James Russell, of Springfield, Mass., having petitioned for the extension of a patent granted to them the 1st day of August 1854, for an improvement in machines for sticking card teeth, for seven years from the expiration of said patent, which takes place on the 1st day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 27th day April next.

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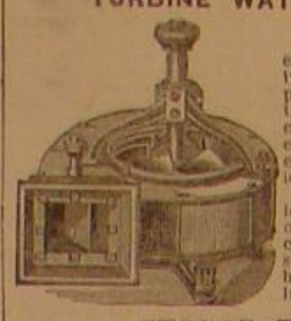

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SCIENTIFIC AMERICAN

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

Vol. XVII.—No. 24. [NEW SERIES.]

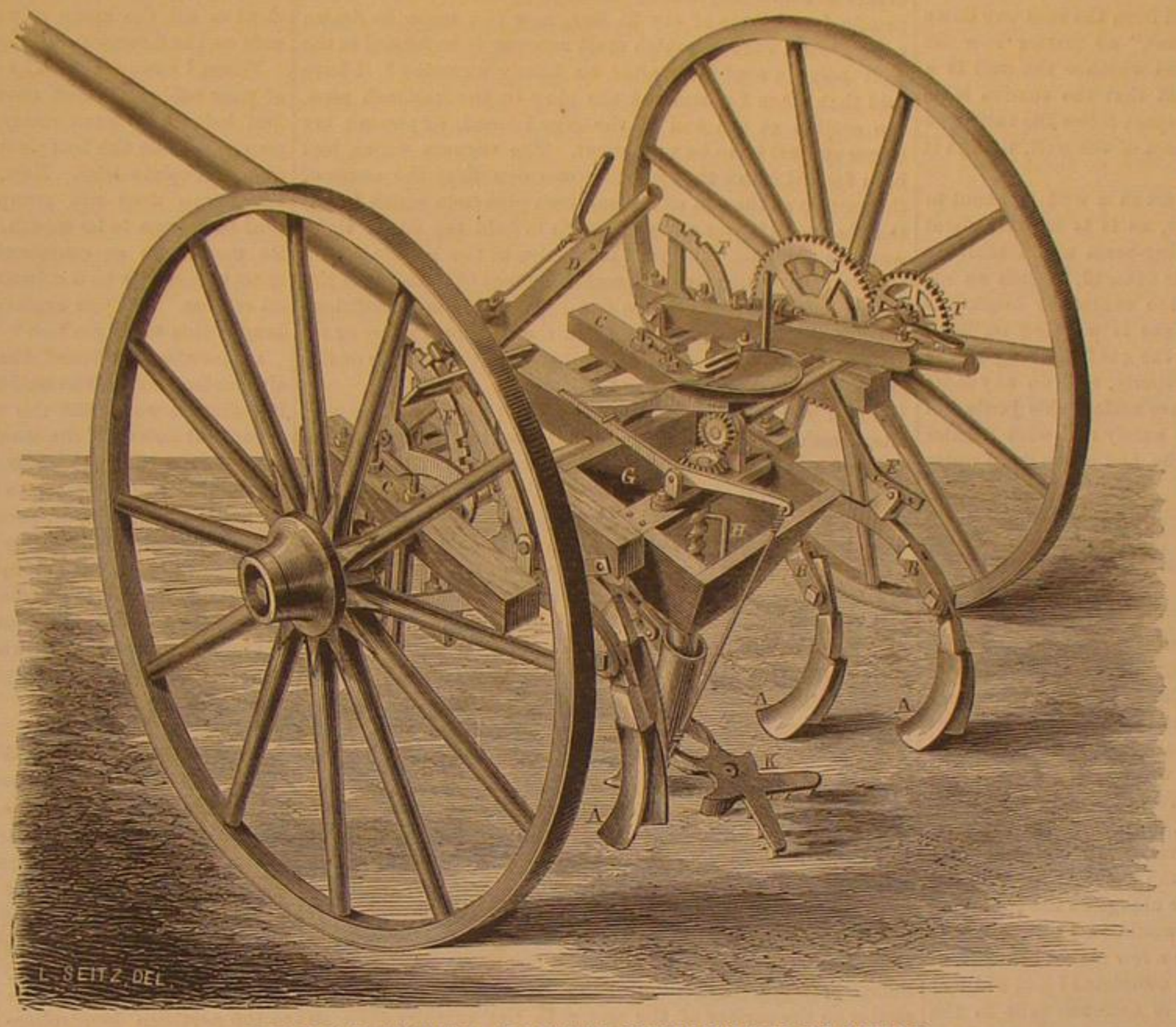
NEW YORK, DECEMBER 14, 1867.

$3 per Annum [IN ADVANCE.]

Improvement in Machines for Planting Cotton.

It is well known that even after passing through the gin, cotton seed have a considerable amount of the fiber attached, which tends to aggregate the seeds in masses and offers great impediments to their deposition in the ground in the manner employed for other seeds, which fall singly by their own gravity. Cotton must also be sown on a ridge, as standing water is injurious to the roots and stalk. A machine for planting cotton which will form the ridge as well as drop the seed is a desideratum. Such is the intention of that shown in the engraving. The frame is supported on the axles of the wheels, and the shares, A, are hung in pairs to curved arms by means of pivots passing through the upper part of the shares and the lower part of the arms, B. This allows the adjustment of the shares at any angle desired. The curved arms, B, are pivoted to downward projecting supports depending from the forward ends of the frame, and they are adjustable in hight by screw bolts, the nuts of which are seen at C. The whole is connected to the levers, D, by means of the straps, E. These levers are held to place, elevating the shares to any required hight, by a spring catch on the levers engaging with recesses on the quadrants, F. All the supports of the shares and their appurtenances are capable of being adjusted to form a ridge of any required width.

The seed delivery of the machine is probably the most important part of the device. The receptacle or hopper, G, is furnished with an upright shaft which projects downward to the delivery spout, its lower end being a spiral or worm similar to an auger. On the shaft are also two arms which revolve with it and serve to stir and keep the seeds separated. One is seen at H. By the aid of these appliances the quantity of seed delivered can be very accurately determined and their separation assured. The grade of the screw and its speed governs absolutely the amount of seed deposited in a given time. This upright shaft is driven by means of a horizontal shaft and two bevel gears, the outer end of the horizontal shaft gearing by the wheel, I, with the wheel, J, on the axle. Behind the delivery spout is the covering rake and scraper, K, intended to cover the seeds as they are dropped. The hight of his coverer is governed by means of a lever passing by the driver's seat, so as to be directly under his hand. An upright lever on the other side of the seat serves to connect and disconnect the feeding shaft at will by means of a sliding clutch, so that the machine may be used as a vehicle when passing to and from the place of labor. The feeding screw, by a suitable arrangement, may be made to operate in a horizontal position and more than one feed box may be employed to plant two or more rows at the same time.



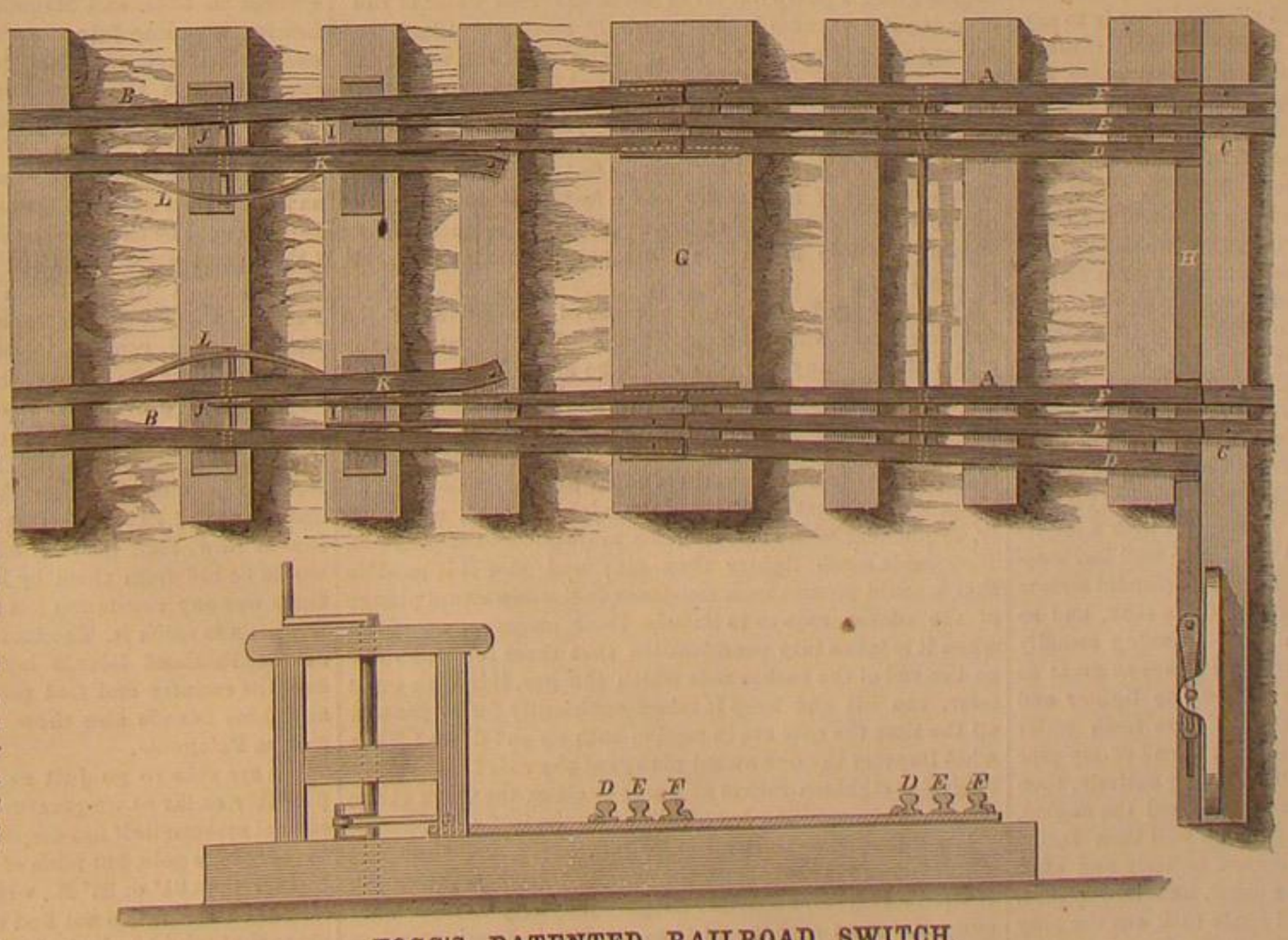
FELL & PHIFER'S PATENT COTTON-SEED PLANTER.

Patented by Henry R. Fell and Edward Phifer, of Trenton, N. J., through the Scientific American Patent Agency, Nov. 20, 1866. For further particulars address as above, or Townsend & Co., No. 7 North st., Baltimore, Md., or No. 237 South Sixth st, Philadelphia, Pa.

Railroad Safety Switch.

The fearful accidents from misplaced switches on railroads seem to demand something more reliable than the dependence on the constant care and attention of a switchman. The object of the device seen in the engraving is to furnish this means of safety. A and B represent the rails of a main track, while C shows the branch track of a siding. The switch is composed of three rails, D E F, at each side, which are nearly or quite parallel with each other and are pivoted or secured to a plate on the tie, G, in such a manner that they may work from a center, the opposite ends of the rails being fastened to a slide bar, H, which is moved by an ordinary crank switch.

The rails, B, of the main track adjoining the pivoted ends of the switch are curved slightly in a longitudinal direction and are in line with the outer rails of the switch, while the tongues, I and J, are in line with the rails, D, E, and F, of the switch. The tongues, I, are rigid, but the tongues, J, which are longer, are designed to yield laterally at their tapered ends, which are in contact with the guard rails, K, and the attenuated ends of I are in contact with the rails, B. The rails, B, are allowed to give laterally, having rods passing through them, the tongues, J, the guard rails, K, and the curved springs, L. The switch rails are secured at the proper distance apart near the slide bar, H, by blocks and keys.



FOGG'S PATENTED RAILROAD SWITCH.

The operation is as follows: When the central switch rails are in line with the main rails, A, a train may pass on the main track in either direction, the wheels when moving in one direction passing over the short tongues, upon the rails, B, and when moving in the other direction passing from these tongues upon the switch rails, E. When the switch is adjusted so that the rails, E are in line with the siding or branch, C, the cars will pass from the latter upon the main rails in the same manner. In case the switch be left with its central rails in line with the siding and a train be running on the main track the wheels of the train will pass upon the rails denoted by C and E, the left-hand wheels passing upon the tongue, J, in line with it, the flanges of the wheels passing between the tongue and the opposite guard rail, and the right-hand wheels passing on to the right-hand rail of the main track. The flanges of the left-hand wheels press the long tongue laterally so that the wheels will be directed on the rails, B, the right-hand rail yielding to admit the passage of the flanges of the wheels on that side, and the curved spring bringing the rail to place after the wheels have passed.

From this explanation it will be seen that in no contingency can the wheels leave the track. This device has been practically and successfully tested. It was patented through the Scientific American Patent Agency Oct. 9, 1867. Address, for rights, etc., Thomas Fogg, St. Mary's, Canada West, or S. E. Martin, Assistant Superintendent Detroit and Port Huron Railroad, Port Huron, Mich.

A Suggestion for Theatrical Managers.

A correspondent from Washington, D. C., who chooses to be satirical, recommends an addition to our sensational and spectacular drama in the form of a boiler explosion. He says:

"Let the boiler be of the most improved kind, of about one hundred horse-power, with a water capacity of about a pint, supplied with all the modern automatic appliances which never require any attention from the engineer; such as water indicators where you never see the water; spring pressure gages which indicate ten pounds when the pressure is one hundred; gage cocks either choked or stuck so tight that the engineer considers it too much trouble to attempt to try the water by that means; the engineer, who has been either a shoemaker or tailor, sitting in a swing suspended from the safety valve lever waiting for the low water detector, which has an infusible plug, to give the alarm, which it does by a tremendous report, scattering fragments of the boiler, human bodies, houses, etc., in every direction; the whole to conclude with a coroner's inquest composed of the same material as the engineer, with the learned professors reading long essays on the mysterious causes (?) of boiler explosions. Introduced in the drama, the effect would be graphic."

Correspondence.

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

For the Scientific American.

EXPERIMENT IN OIL PUMPING.

I believe you are in the habit of answering questions of a scientific character, through the columns of your paper, especially such as are of general interest.

A few friends have urged upon me to state to you the results of some experiments I have made in pumping oil wells, with the conclusions I have arrived at, to know whether your views indorse my own as correct.

In the first place, I will state, that it has become a custom in the oil regions, in tubing a well, to place the seed bag in the second sand rock, which, in some cases, is 75, 100, 150, and 200 feet above the point at which the oil is struck. It has also become a custom to place the end of the pump or "working barrel," either at or above the vein or point where the oil flows into the well. And the prevailing opinion says, "Better 20 feet above the vein, than one foot below."

It is, also, very generally believed to be a fact, that all the water or oil is pumped out of a well from the seed bag down to the bottom of the "working barrel," no matter how far the seed bag is above that point, and whether the well is a gassy one or not. Some even insist that the suction is so great as to lift up the water in the space below the tubing or working barrel, clear from the bottom of the well, though it be a distance of 33 feet.

It is also a noticeable fact, that just as a well is about to cease pumping or discharging, or, as it is termed, about being "exhausted," that the walking-beam and machinery will shake or jar, as the sucker rods descend, to such an extent as to stop the evolutions of the engine, or break the sucker rods. It is then said, "The gas is working on her," and "she is now exhausted," and "the gas is holding up the valves so that they cannot act properly, and do any more sucking," etc. Now, as a rule, I have noticed this jarring of the "walking beam" to occur more surely and with greater force in wells that have but little gas, and pump more water than oil.

I made up my mind to test the matter, and see whether I could not prove that the prevailing practices and beliefs were all erroneous, and, if so, cause a better state of affairs to succeed them.

Now for the experiment. I selected a well which produced but little oil, not more than two barrels per day at the best, and which was not very gassy, but whose walking beam jarred fearfully when (as it was claimed) the gas commenced working. Mind you, there was but little gas to work—not near sufficient to make it an object to use it for fuel. The well was 475 feet deep and the oil was struck within a few feet of the bottom. I put in 460 feet of tubing and placed the seed bag 329 feet from the top, thus leaving 131 feet of tubing, including the working barrel, below the seed bag. When I had 131 feet of tubing in the well and ready to put on the seed bag I tied half-inch pipe alongside the tubing, so that the end of the half-inch pipe would just penetrate the seed bag and not extend more than a few inches below it, so that when the work of tubing was completed I had 460 feet of two-inch chamber and 329 feet of half-inch pipe in the well, one end of the half-inch pipe being just below the seed bag and the other end at the top of the well. After letting the well stand a sufficient length of time to allow of the swelling of the seed bag (over 48 hours to be certain the seed bag was tight), and first plugging up the mouth of the half-inch pipe with a plug, I commenced the operation of pumping; I pumped by "heads," as it is termed, every hour, until each head would produce a bucketfull or two of oil and the well got settled down into its regular old routine—that is to say, until every hour upon starting the engine it would throw a little oil at first, then a greater quantity of salt water, and then a better share of oil, until it quit throwing, and it was said the well was exhausted, or in other words pumped dry from the seed bag down to the mouth of the tubing—(my half-inch pipe all this while remained plugged). Now just as the well quit throwing and the jarring motion of the walking beam had ceased and had begun to run at an accelerated speed, was the time to try my experiment. (I have forgotten to mention that I had placed an elbow on the half-inch pipe and had run it up to a stream of water a short distance above the well and the end of the pipe was beneath the surface of the water and tightly plugged.) Without stopping the machinery, I ran up to the end of the half-inch pipe and screwed out the plug. The water immediately commenced running down the well—(the suction at the end of the pipe when I took the plug out was very great). In a very few seconds my walking beam went down with a jar, its speed decreased to what it had been before the well had stopped pumping oil, and, wonderful to relate, a splendid stream of oil came pouring from the tubing into the tank, and so continued until it had thrown a head—running steadily half the full of the tubing—three or four times as great as it had ever done before, until the oil became lighter and lighter in color, when finally nothing but pure fresh water took the place of the oil. I plugged up the end of my pipe again and waited until the well quit throwing entirely, then stopped my engine. In an hour, again started the engine, still keeping the water pipe plugged. The well then threw brackish water, and as soon as it ceased entirely and after the jarring of the walking beam, as usual, had also ceased, and it had begun to travel rapidly, I again took out the plug and let the fresh water run down. In a very few seconds the well again commenced throwing brackish water, and continued to do so until it gradually changed to pure oil, when about three buckets full were discharged; then it gradually changed until pure fresh water resulted. Now, the water below the seed bag, until the fresh water was introduced, was as salt as brine. I pumped this well for six weeks, varying the time for the heads, but always with precisely the same results. On several occasions, instead of letting water run down when the well would stop pumping, I would take the half-inch pipe out of the water, and withdrawing the plug, would let the air rush in; the well would resume throwing, but it would not last, only discharging a few additional buckets full, and on returning the pipe to the water, and letting it run down, the same result as before mentioned, *i. e.*, a much larger quantity of brackish water, then oil, and then pure fresh water.

The result of the experiment as above described I hold as conclusive proof that the pump does not exhaust the well of either water or oil from the seed bag down to the end of the tubing, and I will try to explain the reason.

I believe it is generally admitted that no ordinary pump can raise water from a horizontal to a perpendicular altitude, of over 33½ feet, because of the fact that a sufficient vacuum or amount of suction cannot be obtained. Now if you cannot create a sufficiently strong vacuum to suck water to a perpendicular altitude of say 35 feet, how can water be drawn away from a vacuum which must necessarily be formed in the well below a seed bag after an hour's pumping? I have said that when I unscrewed the plug in the half-inch pipe, the suction at the end of the pipe I found, by placing my finger against it, to be very great. The vacuum which had been formed below the seed bag was doubtless the cause of the suction at the end of the half-inch pipe from which I took the plug. As it was strong enough to hold my finger tight would it not hold the brass ball valve at the bottom of the working barrel tightly in its socket, so that the raising of the sucker rods a distance of two feet could not create sufficient suction to lift it, much less draw any more water or oil through it and away from the vacuum on the outside of the chambers below the seed bag?

Now I will suppose that upon the first pumping of my well after freshly seed bagging and tubing it, the water was pumped away from below the seed bag to a distance of 35 feet; I then let it stand one hour until this 35 feet was filled up again by salt water and oil flowing in below the seed bag—say that the salt water ran in seven times as fast as the oil—by the time the space was again filled up I had just five feet of oil. As the oil rises from the extreme bottom of the well and the vacuum became less influential, some of the oil in rising would find its way past the ball valve and into the tubing, rising to the top of the water there; this oil would be the first the well would discharge on resuming to pump, and after pumping out another 35 feet, and allowing another hour for it to fill up again to the seed bag, would give me just ten feet of oil in the well below the seed bag; and so on until I had pumped as many hours as 5 is the divisor of 131 feet, the entire distance from the seed bag to the mouth of the tubing. Thus you will see that it would take in round numbers 26 hours before the column of oil would reach down to the mouth of the tubing. Now it has just reached it, we'll suppose, and the well ceases to pump. We stop for an hour—30 feet of salt water runs in and 5 feet of oil. We resume pumping again; a little oil is the first result; that which settles on the surface of the water in the tubing; then 30 feet of salt water, then 5 feet of oil, and the well ceases to pump, quitting on oil. That which is in the chambers rises to the top as the well again fills up, 30 feet more of salt water runs in and 5 feet more of oil; and again a resumption of pumping produces the same result as last mentioned. Now comes the taking out of the plug in the half-inch pipe, and the rushing down of the fresh water. By keeping the engine going I pump out oil as fast as the fresh water is running in; the vacuum is thus partially retained, at least sufficient to keep the oil from rising to the top of the water, and I keep on pumping until I have pumped out 96 feet of oil and then comes the fresh water. I plug up my pipe again, and stop my machinery, having 96 feet of fresh water in the well, the top of the column being just 35 feet from the seed bag. Now as 30 feet of salt water and 5 feet of oil run in, in the course of another hour, that fresh water is made brackish, and starting to pump again the same programme may be gone through with.

I will now try to explain the cause of the jarring of the walking beam which is almost universally attributed to the action of gas. Any one who will take notice to the action of a walking beam when the jarring motion commences will notice that it takes place at some point while the sucker rods are descending; and at various points. Sometimes just as it starts on its descent; at others when half way down; and again when almost down. That the jar is caused, apparently, by meeting with an obstruction to its downward progress. Now gas is much lighter than air; and how is it possible that it could present such resistance to the downward plunge of the sucker rods as to impede their progress especially when it is taken into consideration that there is a ball valve on the end of the sucker rods which the gas, if in such great force, can lift and keep it raised sufficiently for its passage all the time the rods are in motion both up and down? Then what impedes the downward plunge of the rods? Six, eight twelve or eighteen inches of water or oil on the valve at the bottom of the working barrel will cause the jarring.

We will suppose the well to be just tubed, and the water filling the entire space from the seed bag down to the mouth of the tubing. We will also suppose that only 35 feet can be pumped out at a time. If the two feet the suckers separate inside of the working barrel, drawing through the lower valve (or sucker) just two feet of oil; is a perfect divisor into the space of 35 feet on the outside, below the seed bag; then, when the well is about to cease discharging, there will be no jarring motion of the walking-beam, and no breaking or strain upon the rods, and the engine will suddenly accelerate the motion of the beam. But supposing the two feet of oil or water which are drawn into the tubing at each stroke of the beam is not a perfect divisor, it follows, that, on the last stroke up, before the vacuum of 35 feet is completed, it draws through only ten inches (more or less) sufficient to complete the vacuum below the seed bag. The rods rise fourteen inches further, and when at their highest, start down, meeting with no resistance, till the sucker strikes the surface of the ten inches of water which rest on the lower valve, which latter is held tightly in its socket by the action of the 35 feet of vacuum just below the seed bag, and a concussion is the natural consequence. The sucker forces its way through this ten inches of water, picks it up, draws no more water or oil through the valve at the bottom of the working barrel, and on its next descent flies with an accelerated motion through two feet of space; and so the motion increases, and the steam is shut off. If the steam is not shut off, but the engine is allowed to continue at a rapid rate of speed until more water or oil runs into the well, and a few more inches are drawn through the lower valve, but not sufficient to fill the space of two feet, a breaking of the sucker rods on the downward plunge is almost inevitable.

When I have asked: Why do you prefer placing the mouth of your tubing 20 feet above the oil vein, rather than one foot below? I have received the answer; experience has proved it to be the best; more oil is obtained. But no one is able to explain why. Now, as I think I have proved that the pump does not pump out all the water from the seed bag down to its mouth, much less pump it from below its mouth, so as completely to exhaust the well, there must necessarily be a column of water always resting on the oil crevice. Can you explain how, therefore, experience has taught this to be the best?

I have also mentioned, that, during my experiments, I let air run in through the half-inch pipe instead of water, thinking that it would fill the vacuum, and thus enable me to pump out down to the mouth of my tubing. But it would not. I even tried the water on a cased well, which is open all the way from the top to the bottom, so as to admit the air freely; and, after exhausting it, that is, pumping till it ceased producing, on letting the water run down, produced a like result as with the half-inch pipe. Can you explain why the air did not answer the same purpose as the water? That is to say, why could I not continue to pump water so long as the mouth of my tubing and pump are below its surface, after relieving the vacuum below the seed bag, by admitting air? Yours, etc., R. M. Robinson.

Franklin, Pa., Nov. 1867.

The Glacial Epoch.

Messrs. Editors:—On page 341 current volume of the Scientific American Mr. Reid accounts for the glacier epoch by the precession of the equinoxes. Is this cause sufficient for the effect? Can it cover the whole nothern hemisphere with ice as far south as Washington and St. Louis, as in former times? He says that the extreme of cold of the Antarctic was reached in 1248, or 619 years ago, and that it takes 10,500 years to change the extreme point of cold from the southern to the northern hemisphere; and in 9,881 years from the present time the glacier epoch will be repeated in the northern hemisphere. If this cause was sufficient the time which has elapsed since 1248 is so small a portion of the whole time necessary for the change, that the southern hemisphere would still be comparatively near its point of extreme cold. We can go back several centuries but there was no glaciers there then more than at present. Cape Horn was first discovered in 1525, and Magellen passed through the straits bearing his name into the Pacific in the year 1520. These periods approach over 300 years nearer to the time of extreme cold in the south, or to the year 1248, but there is nothing to show that the climate there was any more severe then than it is at present. If the precession of the equinoxes were the cause Patagonia would now be an immense glacier—as it has been at some time—and the passage around Cape Horn would be as impracticable as the Northwest passage, I think, and even the Cape of Good Hope could not have been doubled by De Gama in 1497. The west coast of Patagonia between the mountains and the sea is heavily wooded and I venture to say that trees several hundred years old may be found there as far south as 50°. We have a very poor opinion of Patagonia but it is owing more to the desert character of its soil, east of the mountains, than to its climate. At Rio Negro latitude 41° south, cattle feed in the fields all winter there being plenty of vegetation and no use of hay; and they could not do any better than that at New York latitude 40° 42′ north, where the ground would be hid from them by ice and snow for weeks, and if there was any vegetation left they would require an iron-clad proboscis to reach it. Thousands of bullocks, sheep, and horses on the Falkland Islands latitude 51° S., are running wild over the country and find pasturage all through the winter and these islands also show the work of a glacier epoch as well as Patagonia.

We are able to go just as near to one pole as the other probably as far as temperature is concerned. There has been several systematic if not desperate attempts made to penetrate to the Arctic pole, but none of them have succeeded in getting further than 81° or 82° N., while ships have sailed nearly as far south, and we do not find that great difference of temperature that might be looked for if Mr. Reid's explanation of the cause of the glacier epoch were the true one. The English ships *Erebus* and *Terror*, the same that were lost with Sir John Franklin by being beset with ice at 70° N., had previously

explored the Antarctic as far as 77° S., and might have gone further perhaps but were stopped by the land of the Antarctic continent. The Southern hemisphere has a more even temperature owing to its greater amount of water, and the same has been considered the reason why the thermal equator is north of the real equator, excepting in the middle Pacific. The greater amount of water south has probably cooled the crust of the earth to a greater depth there than at the north, and the internal heat of the earth has less influence on the surface there than here; at least the curving in the thermal equator seems to indicate that its location is influenced by the amount of land.

Say that the mean temperature of the Southern hemisphere is at present 6° Fah. below that of the Northern hemisphere, and that this difference of temperature is owing to the precession of the equinoxes; it will necessarily follow that in 8,262 years from this time the mean temperature of the Southern hemisphere will be 3° warmer and at the north 3° colder than at present, making the opposite state and conditions with the difference of 6° in temperature. Then it will require 8,262 years for the north to become 3° colder than it now is; but within the comparatively short space of 619 years following an extreme of cold must be reached which will cover up the country with icebergs as far south as Washington. And in 619 years after that the climate will be molified and the same as that of Patagonia at present; and we shall have trees several hundred years old also which must have grown up after the disappearance of the glaciers. Even if we should admit that a sufficient cold could be produced within the 619 years from that cause I think that geology shows that the drift period existed for a much longer time than was possible under these circumstances. The question is one of great interest in its bearings on other unexplained phenomena if not in itself. F. A. MORLEY.

Spouting Wells and Flowing Springs.

MESSRS. EDITORS:—On page 307, current volume of the SCIENTIFIC AMERICAN, I find an article under the above caption, signed by Mr. John Wise, of Lancaster, Pa., in which he states that the flowing of springs and wells is not always due to the hydrostatic pressure of the water in the fountains or reservoirs from which they flow; but that in case of springs on the plateaus of mountains, a more philosophical solution must be sought.

Now, with due deference to Mr. Wise's opinion, I must beg leave to differ widely with him on that subject; for I have visited several of these springs, said to be on the very pinnacle of mountains, and I never yet saw one that had not one or more acres of adjacent land, that, on a topographical survey, would be found to be from one to five feet higher than the spring, which, with an impervious sub-soil or rock foundation, as usually obtains on mountains, and an ordinary supply of rain, would be sufficient to produce a continuous flowing spring.

Mr. Wise's more philosophical solution is, to my mind, very unphilosophical; for if the centrifugal force of the earth's axial rotation is sufficient to so far overcome gravitation as to cause water to flow above its fountain level, why does it not prevent it from flowing down the mountain side after leaving the spring? or, rather, to flow still higher up the mountain, in case there was any higher land? It certainly should do this, on Mr. Wise's hypothesis. The fact is, that the centrifugal force of the earth's motion is just capable of raising the water of the equatorial regions to the present ocean level of those regions, which, by Mr. Wise's own admission, is about fourteen miles farther from the earth's center than at the poles, and can no more raise it one foot higher than it can cause water in a pail that is partially filled to flow out over its top when standing erect.

What Mr. Wise says concerning the sponge I consider irrelevant to this question, because its operation is, through capillary attraction, which is quite strong when the sponge is nearly exhausted of water, and weak when saturated.

B. BARKER.

River Falls, Wis.

The Waste of Fuel.

MESSRS. EDITORS:—I desire through your columns to ask for information upon a subject which although much discussed is not entirely clear to me. It is observed that when fresh fuel (coal or light fuel) is added to a furnace fire volumes of dense black smoke issue from the stack. Now what portion of the fuel is this that thus escapes. Again, why does this escape of smoke cease after a short time, although the fuel may not be nearly consumed? After adding dry shavings to a fire I have greatly reduced, in fact, almost prevented this escape of smoke by slightly opening the furnace door for a short time. I reasoned that when the fuel was first added the gases evolved were greater in quantity than the usual quantity of air could consume and the surplus, therefore, passed up the chimney. Now, by opening the doors so as to admit more air they are consumed and a greater amount of heat secured.

Now, if this view is correct, this dense smoke must be the gases, to evolve which from the fuel, heat has been abstracted from the furnace and then wasted. This subject seems to me to be of some importance, for if it is true that all this escape of smoke is a waste of fuel then the waste must be enormous in all of our large manufactories. W. B. C.

Richmond, Ind.

[The smoke is composed of unconsumed gases and the lighter particles of solid fuel—carbon. Admission of a sufficient supply of oxygen, or atmospheric air in a properly constructed furnace is the remedy. The subject is probably well understood by intelligent people.—EDS.

RAILWAY BRIDGES---THEIR MATERIAL AND MODE OF CONSTRUCTION.

Jervis in his "Railway Property" makes the following very just remarks on the bridges of railways which are particularly pertinent in view of the disasters occurring in various sections of the country from the insecurity of these structures. His directions and suggestions will be found to be valuable:

"In this country bridges are mostly constructed of wood; in England, brick is very extensively used, and in that mild climate may answer a good purpose. So long as bricks continue durable, they give similar stability to stone; but in the northern States of our country they cannot be recommended. In any situation where good building stone may be had, it admits a cheaper structure than brick; it has fewer joints and is less exposed to fracture. Timber is generally used for its cheapness, and the facility it affords for rapid construction. Such bridges are sometimes constructed with stone abutments and piers, but often with frame-work of the same materials. It cannot be denied that in many cases in this country, considerations of expense absolutely control this question, and leave the engineer no choice. It is nevertheless a matter of importance, both in regard to the permanent economy of a railway, and of its safety in use. Timber has only a moderate degree of durability, when exposed to the vicissitudes of our climate; and efforts for its preservation in bridges in this country have not been attended with any great success. Housing has proved very useful for bridges on common roads, but the danger of destruction from fire by locomotive engines renders this form of security on railways less desirable. If a bridge is covered, the inside that is exposed to fire from the engines should be kept well covered with a wash of lime and salt, as a protection of much value against fire. Covering the top with a decking has proved of doubtful utility, and many are now left to the free action of the elements.

The length of time timber will last in a bridge, especially an open one, is quite uncertain, and there is danger that it will be trusted too long for safety. The first decay will be in the interior of the scantling; this may be to a serious extent while all exposed to observation appears sound and safe. The traveller on the railway cannot examine the bridge—he must depend on the railway agent, under the proprietary interest in the question; and the agent may be satisfied with the exterior, or from other cause neglect the proper examination, until some train falls through, when it will be sadly certain that it should not have been trusted so long.

A large portion of the bridging that has been built with timber spans, might be made with stone arches not exceeding forty feet span, and many of these with less span. Where abutments of stone are made, as retaining walls for the bank, and to support the timber span, in such situations as allow sufficient hight for arching with stone, it will often be found that stone arches may be erected with small additional expense over the wooden structure, resting on stone abutments and piers. Arches for this purpose may be substantially made with a good quality of building stone and hydraulic cement at a moderate cost. Dressing stone to courses is not generally necessary for the permanence or stability of the work. Arches of unhewn stone, with proper spandrels, have been successfully built of seventy five feet span, with rise of one-quarter, for the use of common roads. I would not recommend going to this extent without dressing the stone for a railway bridge, but there is not the least difficulty in carrying them to fifty feet with one quarter to one third rise according to quality of stone. When materials can be had that are suitable for abutments and piers, they can generally be found sufficient for the sheeting of an arch. In making arches of unhewn stone, a common error should be avoided—namely, dressing the ring or heading courses; which not settling with the rest of the arch, is very likely, in arches of considerable size, to split off and separate from the main body. This is mostly done for appearance, and is sadly at the expense of stability. The heading should be of the same workmanship as the body of the arch, giving it no more care than would be given to the face of an undressed wall.

There are comparatively few situations where arches of more than 50 feet are required, to provide sufficient opening for the water-way. If one arch is not enough, two or more may be provided. Small arches are less expensive for the span they provide than large ones; and hence it is often better to make two arches of equal aggregate span than one, to provide a given opening; and they require less hight. The size of the opening for water-way will depend much on the exposure to obstruction from drift-wood or ice; and it will require careful observation to settle this on a safe basis. It is not often serious on small streams; but for large streams, exposed to heavy floating ice and drift-wood, the safety of the structure will depend materially on the proper disposition of this question. The opening that may be necessary to give free passage to the water, is the first question to be considered in planning a bridge or culvert. It should be sufficient to pass any floating substance likely to be brought by the current to the bridge. On this point it is best to err on the safe side, in order to be prepared for that great flood, more weighty than any previously known by the oldest "inhabitant." A water-way barely adequate to pass a flood will severely try the foundation; and it should be kept in view, that occasionally—perhaps once in a quarter, or half a century—streams of water are swollen much beyond ordinary floods, and sweep off what had been regarded as well tried and safe. The water-way may require two or more spans to provide sufficient flow, but each should be wide enough to allow any ice or drift-wood that the stream may bring down to pass through freely, so as not to dam up and obstruct the flow of water. In regard to ice, if the stream directly above the bridge is rapid, the ice will be broken into small pieces, and pass off with little hazard of forming a dam at the bridge; or if it be very crooked and sluggish, the ice will be held in its original position, until it becomes too weak to cause much obstruction in passing the bridge. There are comparatively few streams that would not be safely secured against ice or drift-wood forming a dam, by spans of 50 or 60 feet; and if more is required to give sufficient water-way, the number of spans can be increased accordingly. If larger openings than 60 feet are required, and there be sufficient hight, stone bridges may be advantageously erected, but will require more expensive workmanship and materials.

The remarks in relation to the masonry of culverts are applicable to that required for bridges. For bridges of unhewn stone, the stone should be larger in proportion to the magnitude of the walls and the pressure they may be required to sustain. The judgement and experience of the engineer must decide, as to the pressure from the hight or span of the work required, how far he may with safety adopt rough or unhewn stone-work. So far as this can be done, it will be much more economical than hewn stone; and, as before remarked, it will be found in general that by far the greatest proportion of bridges may be constructed of unhewn stone, without sacrifice of any material stability. It sometimes happens that the stone quarries that must be resorted to will furnish stone in such shape, that it is little more expensive to make regular courses roughly hewn than rubble work, and in such cases it will be advisable to form courses of uniform thickness of stone for the more important features of the work.

Stone arch bridges require more hight, or space below the grade level, than timber; and it is to be considered whether or not this can be obtained without too much sacrifice in the cost of grading. It sometimes occurs that the formation of the approaching country, on which the line of railway is laid, is low in comparison with the bed of the valley or stream over which the bridge is required to be made, and the most favorable grade for the approach does not give space for the stream in time of floods under the bridge; and the expense of raising the grade will sometimes so control this question, as to lead to the adoption of timber or iron for the want of room for arching. The grade should be high enough to be beyond the reach of all floods in the stream, and a few feet additional is all that is necessary for arches of small span; and when this can be obtained at moderate additional cost for the filling, arches of stone should be provided for. In examining the circumstances of grade with a view of ascertaining what room may be had for arching the bridge or culvert, it will be kept in mind, that raising the grade will improve the facilities for drainage, a matter never to be lost sight of in the construction of a railway, and will always justify some expense to improve it, even when otherwise fair.

It must be conceded, however, that there are situations, where a railroad passes over a flat country, with shallow valleys for its streams, where timber or iron must be used for the spaces or spans between the abutments and piers, for the want of room to put in arches of stone; but the cases are not comparatively numerous in which this may not be avoided by a judicious management of the grade lines. Cheap construction in the outset will call for low grades in a flat country, but the true and permanent interest of the work requires them to be higher than they generally are, both in relation to passing streams with safety, and to give effective drainage. Low grades, and consequent imperfect drainage, have been a very prevalent error on the railway constructions of this country. The engineer should keep this in view, and avoid the error.

Iodine and Carbolic Acid.

The *Journal des Connaissance Médicales* publishes a letter addressed to Dr. Caffe on Dr. Percy Boulton's late discovery of the action of carbolic acid on iodine. "The inconvenience," says the writer, "attending the external application of iodine and its preparations is so serious that physicians are often compelled to abandon a remedy the therapeutic efficacy of which is undoubted, nay almost unequalled in *materia medica*. The great objection to the external use of this remedy is, that it leaves marks both on the linen and on the skin. This is a sufficient motive for seeking some means of getting rid of this drawback, especially in the case of ladies. Dr. Percy Boulton's method consists in adding a few drops of phenic (carbolic) acid to the iodine solution to be employed. This addition renders iodine perfectly colorless, so that it may be applied with impunity. But this combination has another advantage. It appears from that practitioner's observations, which I can confirm, that, so administered, carbolate of iodine, which is the new substance in question, is not only one of the most powerful antiseptics we possess, but is intrinsically a more efficacious agent than iodine alone. I have used this compound under the form of injections, gargles, and lotions, in all cases in which iodine is prescribed. In sore throat, ozæna, abscess in the ear, etc., this preparation is a sovereign remedy; since, besides its disinfecting qualities, it modifies the mucous membrane, causes all local sensibility to disappear, and cures the patient much sooner than if either of the two agents were employed separately. The formula I employ is as follows: Compound tincture of iodine, 3 gms.; pure liquid carbolic acid, 6 drops; glycerine, 30 gms.; distilled water, 150 gms. The writer then enters more particularly into the properties of carbolic acid, but with which our readers are already acquainted. Its efficacy as a disinfecting agent in the case of sores is well known; it may be prescribed in all cases in which tar water is administered, and is, we trust, now pretty generally adopted for disinfecting purposes in hospitals and barracks.

Science Familiarly Illustrated.

Natural Qualities and Peculiarities of Glass.

This material is as old as reliable history. The fable which ascribes its invention or discovery to the accidental fusion of an alkali with seashore sand by a fire made by shipwrecked Phœnician sailors is not worthy the degree of credence we usually yield to Pliny's relations. Glass beads and imitation gems have been found with Egyptian mummies which must have been interred over 3,000 years ago. In fact, at Thebes was discovered a glass bead of rare purity which had the name of a monarch inscribed upon it who lived 1,500 years before Christ. Glass lenses, bottles, and vases have been found in the ruins of Nineveh, and it is not improbable that glass was known long before it was manufactured into articles of use or ornament; for in the process of the reduction of metallic ores and in the baking of pottery the vitreous debris must have been noticed. According to Theophrastus the manufacture of glass was practiced 370 years B. C., and the processes of grinding, coloring, and gilding were then in use. Colored glass was used in church windows in the eighth century, and in the time of the crusades the art of ornamenting and decorating articles of glass was introduced from the East. Works were established at Murano, near Venice, and for a long period the Venetian glass was justly celebrated for its elegance. Many of the ornamented objects made in Venice have been lately reproduced; that known as the Venetian ball, so popular now for use as a paper weight, being an instance. They are made by combining pieces of colored glass to imitate flowers, etc., and introducing these into globes which are compressed or flattened upon the designs by the blower drawing in his breath and thus exhausting the air from the interior. The lens form of the envelope has the effect of magnifying the ornamental objects. Frosted glass is produced by dipping the hot glass, before blowing, into cold water, reheating it and blowing before the cracks on the exterior are closed by fusion. Probably the finest specimens of ornamented glass now made are those manufactured by the Bohemian peasantry. The cause of this excellence is partly the superiority of the materials existing in Bohemia and partly to the wonderful skill in manipulation attained by patient and constant practice.

Glass is a chemical combination of silica, potash, lead, lime, alumina, and other substances intended to produce silicates of these bases. The colors are produced by metallic oxides. The specific gravity of glass varies with its composition from 2·4 to 3·6. When cooled it is exceedingly brittle, but when softened by heat is very tenacious and may be molded at will. It can be drawn into threads of extreme tenuity, and in this form has been woven into silk, producing an elegant effect. These threads are quite elastic, as is also a solid globe; even hollow balls have been dropped upon an anvil from a hight of ten feet, when they would rebound to at least one-third of that hight without sustaining a fracture. This quality of elasticity when in the form of thread has lately given rise to the story of an attempt by a French chemist to unite masses of these elastic threads by partial fusion, with the object of producing a flexible glass. The project is too ridiculous to merit serious remark. When glass ceases to be brittle it will probably lose some of most valuable properties, which seem to be inseparable from this objectionable quality.

On The Manufacture of Malleable Castings as Practised in Europe.

The material generally employed in European founderies for the manufacture of malleable castings. is Scotch pig iron, which, however, must be free from sulphur and phosphorous. Though the brand of the pig is kept secret as much as possiple, the writer has detected that the various shops are using different brands. The melting of the pig is performed in crucibles of plumbago, holding about sixty pounds each. They are covered with a lid of chamotte for the purpose of avoiding the falling in of coke, which by a subsequent removing would evidently cause a loss of heat. The hearth of the furnace is constructed of chamotte stone, and having a width of two or three feet square, is adapted but for four crucibles. Blast is not employed, it having been found that time is saved only at an expense of fuel, the natural draft through the flue being quite sufficient. We have it already noticed that the fused iron is cast into the forms at the highest obtainable heat; to recognize the same requires some experience, however. The workman knows that the charge is ready by simply dipping a red-hot iron rod into it, on the withdrawal of which a scintillation takes place. The crucibles are then lifted out from the furnace, and when the surface of the fluid mass is skimmed, the molding is commenced with. Small pieces, as keys, locks, and parts of sewing machines, are cast in sets with a common gate, from which they are detached again after cooling. In casting a larger and more complicated model, we have to examine beforehand where the so called *suckers* are to be formed in the sand; they form reservoirs, are filled in casting, and when the piece cools down it sinks from them. If this is obviated, cracks are produced at the spot where the molding of a sucker would have been necessary. Though these cracks are often so small that they cannot be perceived, they make their appearance when the casting has gone through the second process, which we will describe hereafter. Those reservoirs are made at the elbows of levers, at the edges of bent pieces, and wherever the dimensions vary rapidly; however, care is taken not to heat them off too soon, as the castings are exceedingly brittle unless thoroughly cooled.

The molding boxes are either set vertically or almost so, the former position always being used for smaller molds. Four or six of them are fastened together with clamps, and placed with the gate upwards. Molding is done very carefully, in order that the article obtain a smooth surface, and cleaning be possibly avoided after the "heating." This process is intended, as well known, to give to the castings all the properties of forgeable iron. The same consists in embedding the castings in hematite powder, and exposing them in cast iron boxes, called mufflers, to red heat for several days. Formerly founders were of the opinion that round mufflers were preferable to square ones, but now they employ square boxes of one inch iron, a cover being attached to them to protect their contents from the atmosphere. As to the heating oven, it is of simple construction, the fire gases being allowed to play around the boxes which are placed in the back part of the oven, a good fire is made at once, and after this packing is done in regular intervals. The castings are left inside for three, four, or five days, according to their size, and one oven is made to hold 700 to 900 lbs. The boxes with the large castings are exposed to the greatest heat, while those with the small ones are subjected to the lowest temperature. If it be thought that they are heated sufficiently, they are left to cool gradually, and after having been unpacked the castings are cleaned according to necessity.

REFFELT'S EDUCATIONAL APPARATUS.

The slate and blackboard are efficient aids to education; their usefulness being mainly based upon the fact that none of our senses are so sensitive or retentive as to details as that of vision. To see is to believe—to be convinced—an occular demonstration being one admitting of no reasonable doubt. For this reason "object lessons" have become a deservedly

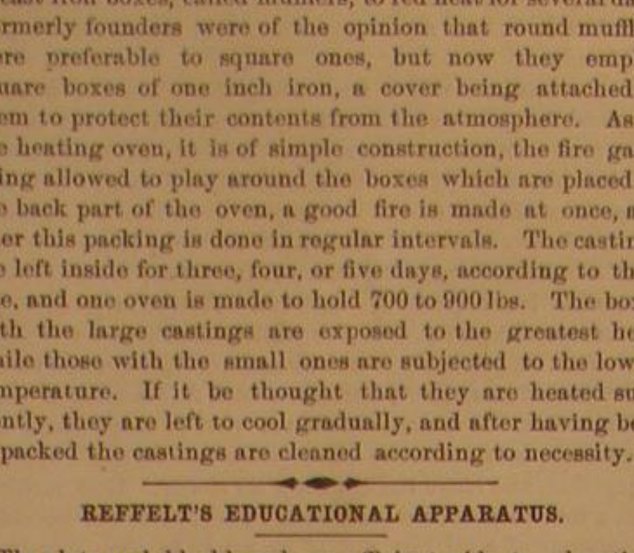


Fig. 1

favorite means of imparting instruction, and fulfill admirably the work demanded. The mechanic, even, however educated he may be, prefers always a model to a drawing or diagram; the work to be done being presented in every position, as well as in detail.

Acting on this principle, the inventor of the devices shown in the engravings accompanying this description has constructed convenient appliances for the school-room or the family, designed to facilitate the acquirement of the relation of numbers and the knowledge of the elements of a language.

Fig. 2

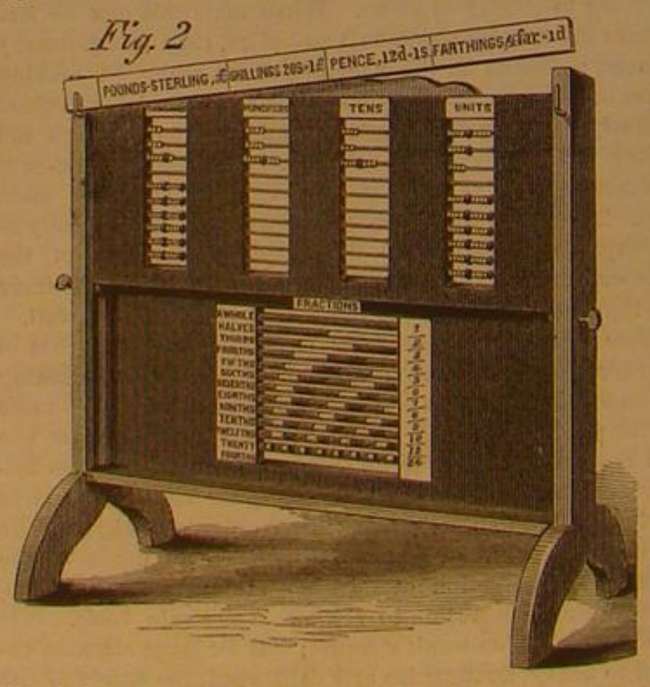


Fig. 1 shows what the inventor calls an "alphabeticon." It is a frame supported on standards, the frame being composed of solid boards, having suitable apertures and slides in combination with a disk which revolves between the two sides of the frame, and is marked in annular spaces with the dipthongs, consonants, and vowels of any language, as English, German, French, etc. It may contain, also, the arithmetical characters from 0 to 9, inclusive. By turning the disk by means of handles inserted in its periphery, either of the letters or characters may be brought before the appropriate aperture in the side of the frame. The apertures may be covered, or partially covered, by slides. Cases attached to the sides of the frame may be made to hold such additional slips of letters, or other characters, as may be desired after those on the disk have been fully learned. If, for instance, the slide over the vowels is opened, the pupils see only that letter which is brought opposite the aperture in the side of the frame, but by turning the disk all the vowels may be successively brought to view. When sufficiently acquainted with any one of the series the scholars may be introduced to combinations of vowels, consonants, and dipthongs, by the presentation of the proper characters in combination to form syllables, words, and sentences. The patent for this apparatus dates January 2, 1866.

Fig. 2 is a contrivance on a similar principle, but intended, more particularly, for teaching arithmetic. It consists of an upright frame divided into two parts, an upper and a lower section, which slide up or down in grooves in the uprights. The upper section consists of four divisions and five blackboards, behind which are four hundred balls of wood or other material, there being ten strings or wires in each division, and ten balls upon each string. Besides, for the more ready computation, every fifth ball in each string is distinguished by a color differing from those on each side of it. The balls in the first division, at the right, represent the units; those on the second, the tens; those on the third, the hundreds; and those on the fourth, the thousands. The balls remain behind the blackboards when not in use.

If it is desired to indicate, for instance, 6485, you bring out 5 balls in the first division, 8 in the second, 4 in the third, and 6 in the fourth. At the same time the number of balls in each division, with figures, is written on the respective blackboard. If a division at the right remains empty, a nought (0) is written on the respective blackboard. The fifth blackboard is used to write down, in large numbers, the tens of thousands, the hundreds of thousands, the millions, etc. On this apparatus the pupil easily learns how to write numbers correctly by figures, and to count upwards and downwards, by 1, 2, 3, 4, 5, etc.

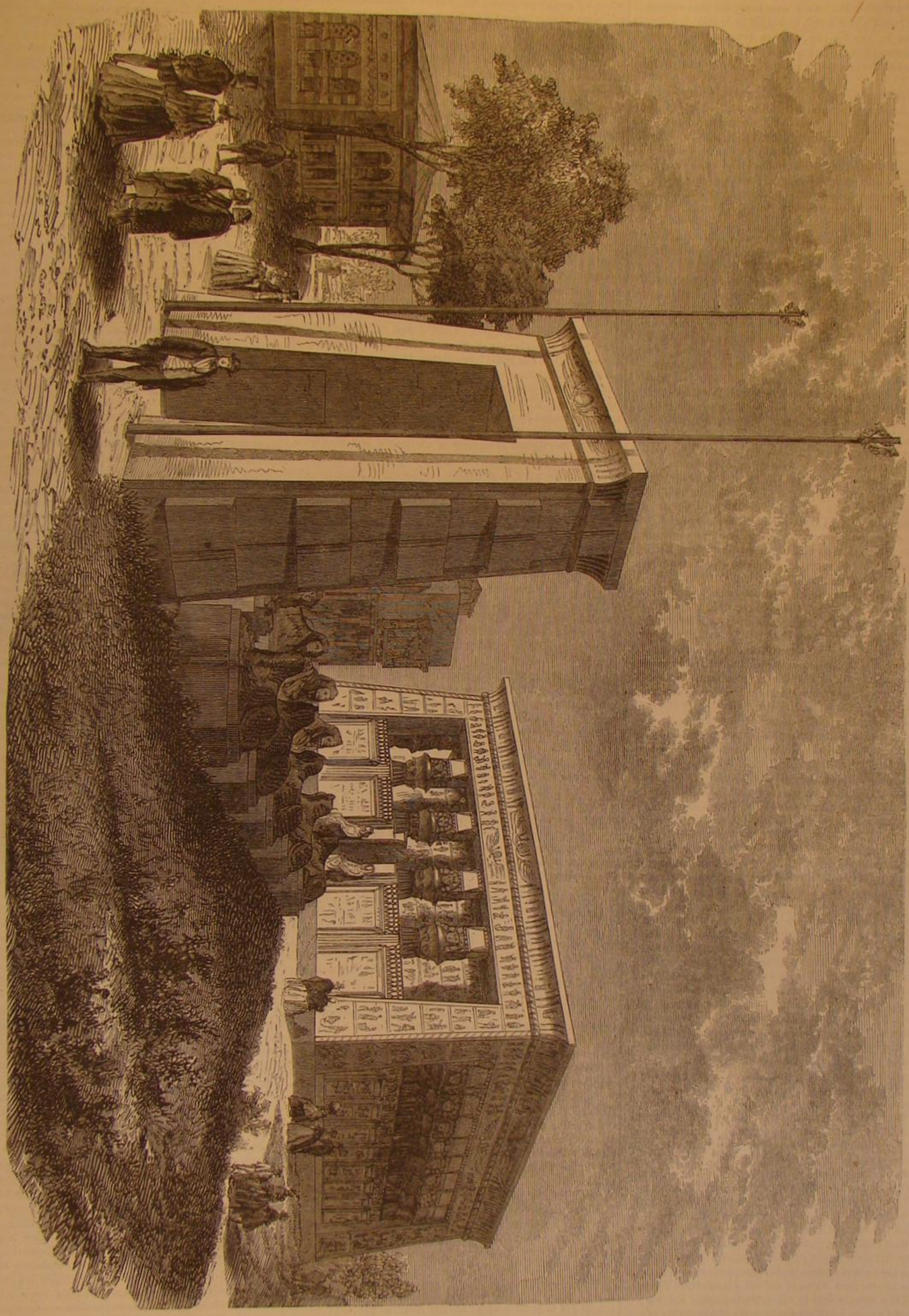
Addition, subtraction, multiplication, and division, are performed in a similar manner, the method of which for each operation is easily learned by a little practice.

For the purpose of teaching the fundamental rules of denominate numbers, there belong to this apparatus 7 sticks, containing 14 tables of money, measures, and weights. When these sticks are fastened above on the apparatus the balls will represent the things named on the sticks. The use of the balls is the same as in the simple numbers, only that the number of units that it takes of the next lower denomination, to make one of the higher, is different. For convenience of the teacher and pupil, these numbers for every higher denomination are given on the respective sticks. By seeing them very frequently, the child will easily learn them by heart.

The second section of this apparatus consists of one division and two blackboards, behind which are twelve cylinders of equal length upon twelve strings or wires. The cylinder upon the first string is undivided, thus representing a whole one. The cylinder upon the second string is divided into two equal parts, thus representing halves. Upon the third string there are the thirds, upon the fourth strings the fourths, and so forth, to the tenths. The eleventh string contains twelfths, and the twelfth string twenty-fourths, because both are of great importance in the different transformations of fractions. The two blackboards serve to hide the fractions not in use, and to make upon them the needed fractional calculations. Fractions can easily be treated, when their fundamental principles are clearly understood. The apparatus shows that the nature of fractions supposes a division into equal parts. The appearance teaches that in the more parts the whole is divided, the smaller the parts will be, and in inverse proportions; thus, that with equal numerators, those fractions are the smallest having the largest denominators, and those the largest having the smallest denominators. It will be seen that a fraction can be considered as a denominate number, of which the denominator is the name, and the numerator the true number. It will facilitate the pupil's writing fractions in the common way, and counting upwards and downwards with fractions. The pupil will readily learn what is meant by fractions of a common denominator, and understand that only fractions can be added or subtracted when they have a common denominator, or when they are reduced to equivalent fractions having a common denominator. How this reduction is to be done can be clearly shown by the apparatus. The appearance teaches that a whole one is equal to two halves, to three thirds, to four fourths, etc.; that $\frac{1}{2}$ is equal to $\frac{2}{4}$, to $\frac{3}{6}$, to $\frac{4}{8}$, etc; that $\frac{1}{3}$ is equal to $\frac{2}{6}$, to $\frac{3}{9}$, to $\frac{4}{12}$, etc.; that $\frac{1}{4}$ is equal to $\frac{2}{8}$, to $\frac{3}{12}$, to $\frac{6}{24}$, etc., etc.; and in inverse proportion. It is readily shown by it that the value of any fraction is not changed if both numerator and denominator of it be multiplied or divided by the same number. In the same way it will be observed that multiplication of a fraction is accomplished by multiplying the numerator or dividing the denominator, and that division of a fraction is effected by dividing the numerator or multiplying the denominator. If the pupil clearly understands these principles of fractions, all other exercises in them will be very easy.

Mental arithmetic can be readily taught by this apparatus, the advantages of which will be easily apprehended by the intelligent pupil, as well as by the teacher.

The patent for this device is dated March 3, 1863. "Reffelt's First Book of Arithmetic" is a guide to its use, which is for sale by E. Steiger, No. 17 William street, New York city, and the apparatus can be obtained either of him or of the inventor, H. R. Reffelt, 74 Bloomfield street, Hoboken, N.J., or of Nathaniel Johnson, 490 Hudson street, New York city, either of whom will receive propositions for territorial rights. The letters patent were obtained through the Scientific American Patent Agency. The frames for counting and for working fractions may be made and used separately, and are furnished thus or combined. These devices were exhibited in the Paris Exposition, and were very favorably noticed by the London journals



MODEL OF THE EGYPTIAN TEMPLE IN THE CHAMP DE MARS.

In front of the Temple stands a monumental gateway, ornamented on the front entablature with winged globes. With the exception of reduced proportions, this is a faithful reproduction of one of the gates of Thebes—the City of the Hundred Gates—where are found the largest ruins in Egypt, and from which place was brought the obleisk that now ornaments *La Place de la Concorde*. Passing through this gateway you enter an alley formed of two rows of granite sphinx, modeled from the originals, and that give some idea of what this majestic avenue must have been.

The one at Thebes was nearly 7,000 feet in length, and was not situated back of the gate, but in front of it, the intervening space between the center gate and the steps of the Temple being ornamented with magnificent trees. Sufficient space was not allotted to the Egyptian Commission to reproduce this arrangement, but the plan adopted gives a good idea of this splendid monument of antiquity.

This Temple is less the reproduction of any particular edifice than a study of Egyptian archeology. Notwithstanding, in its plan and general arrangement, as well as in the harmony of its proportions and the details of sculpture, it reproduces the Kiosk of Philos with sufficient exactness to call it an imitation of that celebrated structure. The outer vestibule, formed by massive columns, runs all round the sanctuary, in which are placed several of the wonders of the Museum of Boulac. The columns are most faithfully executed, and represent the stem of the lotus plant, with elaborate capitals in the form of the blossom, rendered in all their complication of form and color, with an exactness that attests the most advanced art. From the center of the lotus blossom rises a figure with four faces, that forms a second capital having an extremely original effect. The head is that of the goddess Athor, the presiding deity of joy and happiness, and who forms one of the Egyptian trinity Her face is repeated four times on each column, with a headdress composed of a piece of cloth twisted in a roll and entirely encircling the

head, only suffering the cow's ears to appear that represent one of the forms under which this goddess is most frequently represented in the temples. Above these heads is a third capital, ornamented at the top with small symbolic serpents. On this rests the cornice of the temple, which slightly projects.

These columns are imbedded as high as their capitals in a wall that forms the first precinct of the sanctuary. The partially pyramidal style preserved in the construction of this building gives it a character at once simple, solid, and grand, and with which it is impossible not to be impressed. The outer walls of the Temple, as well as those of the corridors and the inner sanctuary, are covered with admirable hieroglyphic pictures, mostly basso relievos in the Egyptian style, and slightly projecting from a hollow background. All the inscriptions, cartoons, and figures, as well as the paintings, have been copied with the greatest care, and make a faithful picture of the events and exploits—religious, military, and civil—of this ancient people. Those on the outer walls represent the time of the Ptolemies cotemporaneous with the Roman Republic. All the subjects are religious, symbolic, and mysterious—kings and queens artistically grouped beneath slender palm trees, bringing lotus blossoms or jewels of the most brilliant colors and other offerings to their gods, who are depicted in the grandest and most imposing attitudes—small cartoons skillfully interwoven as ornaments, bear the name of the sovereign or individual performing this act of devotion. The walls of the corridors and the inner temple are also covered with paintings. Among them some of the time of Pharaoh, cotemporary of Moses. The subjects are purely religious, and are so finely executed and elevated in their character that they show Egyptian art and faith were then at their zenith. On the walls on either side of the principal entrance are two tablets, the carving on one representing the departure of an armed expedition—the warriors with battle axes, the transports and vessels laden with equipments. On the corresponding tablet is seen the queen receiving the victorious general on his return; the galleys are represented as vessels of pleasure as well as of war and have brought the queen to greet the expedition. With the army are seen the spoils and the prisoners.

The decorations of the inner sanctuary are those of the earliest date known. Opposite the entrance and in the center of each of the side walls are doors of oriental alabaster of a peculiar form and of the most complicated workmanship. The cornice, door posts, and the pillars that support the open roof are ornamented with wreaths of flowers, among which the lotus is preëminent. Entwined in all the decorations are two names that are incessantly repeated—those of Ti and Phtah-hotep, dignitaries of Memphis, and on whose tomb are seen nearly all the subjects that appear on the tablets. But here nothing is symbolic or religious in character, but simply admirable reproductions of scenes depicting the life of that period. Fishing, the chase, the arts and mechanics, animals of all kinds, birds, fish, cattle, horses, and dogs, gymnastic games in all their details, feats of skill, boating, etc., all are faithfully delineated and form a most complete summary of the life of the ancient Egyptians.

Animal Electricity.

To the agency of friction, the amber of the ancients, the chemical action of modern voltaism, the mysterious properties of natural and artificial magnets or loadstones, and that peculiar vital principle inherent in certain animals, are due all the effects generally included in the comprehensive term electricity. If to these primary causes we add those of terrestrial currents and inequality of temperature, we provide, at least in theory, for all those atmospheric phenomena hitherto inexplicable upon any known data. If, as a certain eminent ecclesiastic remarked, "chance is a word to express our own ignorance," what a "chance" electricity must be. It is to the *savant* and the philosopher what "heart disease" is to the coroner and the faculty. Exactly a century ago galvanism was first discovered, and the term was applied to describe a species of electrical excitation, presumed at that time to differ materially in its origin from all other similar effects. Evidently the cause was referred to some muscular agency, which produced a peculiar sensation or taste when two dissimilar metals were applied, one upon the upper and the other upon the lower surface of the tongue. Sulzer who made this discovery, ascribed it to some vibratory motion produced in the nerves of the tongue, naturally a highly sensitive organ, and inferior in that respect only to the eye. Galvani, whose name is familiar with the celebrated experiments upon the limbs of frogs freshly killed, more fully developed this theory, and was the father of a new school, which, while recognizing the cause of these post-mortem effects to be connected with electricity, yet affirmed that they were due to some especial modification of that unknown agent, residing solely in the animal system, and consequently bestowed upon it the appropriate name of animal electricity. The celebrated Volta was the first to successfully dispute this view of the subject, and to establish the identity of the origin of galvanic and electric phenomena. Recent experiments have confirmed the theory that animal electricity does not owe its origin to the formerly imagined action of the nerves or muscles, but eminates directly from a purely chemical source, the exciting cause being generated by the contact of the air with the incipient decomposition of the freshly-killed animal. Bearing in mind that a liquid, but very slightly saline, in contact with animal substance is an electrometer, it is easy to perceive that the so-called muscular current is nothing more than the current produced by their contact. To put beyond a doubt the question that a live muscle would generate electricity, which it could not produce when dead, contact has been made between the muscles of a live animal and the wires of a galvanometer, without the latter evincing the slightest sign of an electrical current. Moreover, if a portion of muscle be separated from the body of an animal freshly killed, and placed in communication with a galvanometer, a feeble degree of electricity is demonstrated. According to the opinion of a member of l'Academie Française, this is due to the influence of oxygen upon the flesh, a cause always existing when the muscles retain their normal state of irritability. Assuming that animal electricity was due to the cause surmised by Galvani, the evidence of the current would cease so soon as the muscles become completely inert, or, so to speak completely dead. But the reverse is the fact. The more decomposed the flesh becomes the stronger are the advances of its electrical condition, and when it has acquired a state of almost total putridity it imparts the maximum deviation to the astatic needle. That the presence of a saline liquid is necessary to these electrical effects is proved convincingly by several circumstances. One is that meat newly salted becomes electrical in proportion to the penetration of the solution, and the other that cured meats, whether beef, pork, or fish, evince a high state of electrical development. The blood of a living animal is altogether destitute of electrical excitation, but becomes capable of affecting the galvanometer so soon as the animal is killed, and its power increases with the putrefaction of the body. A small addition of common salt to the blood immediately increases its electrical sensibility. If the epidermis of an animal be removed the under layers of cuticle are highly electrical, as experiments upon frogs have demonstrated, and this condition is still further augmented by the addition of a saline solution. From these results we are justified in assuming that animal electricisy in its original symptoms is a delusion, and that without the intervention of some slightly saline liquid the nerves and muscles are *per se*, powerless to afford the smallest evidence of an electrical current. Unless a chemical action can be set up there is nothing to indicate the presence of that vital muscular agency which the first experiments in connection with the subject led the older philosophers to insist upon and adhere to. The animal current, which they so fondly prepounded and believed in, is simply an ordinary electrical current produced chemically by the contact of a saline solution with animal matter, in which combination the salt acts the part of the electrometer. Adopting this view of the question it is easy to perceive that the development of animal electricity, in invalids and diseased organs, instead of being due to the cause originalty entertained, is solely the consequence of chemical decomposition. Thus, for instance, the muscous membrane of the mouth becomes electrical in patients suffering under disease of the stomach or digestive organs, and strong evidences of it are manifested in malignant, cancerous, and other ulcers of a dangerous and fatal type. All animal excretions are electrical, and urine possesses this property in so remarkable a degree as to cause the needle of a galvanometer to make a complete revolution of the dial. The electricity of fishes results from an alkaline solution in the cells of the electric organs, and manifest itself very powerfully. All the effects of animal electricity may therefore be regarded as closely resembling those of fermentation and putrefaction, and to depend not upon any muscular or nervous hypothesis, but solely upon an incipient chemical decomposition in combination with chemical electrometers.—*The Engineer.*

Wooden Railroads.

The earliest form of railway consisted of wooden rails laid on cross ties. When well constructed there is no doubt of their utility and success. During the late war the Confederates were often obliged to make use of wooden rails, and over them they transported thousands of tuns of army supplies, and soldiers. A much higher rate of speed may be obtained on wooden roads than is generally supposed. If properly built, a speed of fifteen or twenty miles an hour may be safely attained, which is as much or more than is realized on some iron roads, rated as first class, but too often, in reality, rotten and unsafe concerns.

One of the requisites for the successful working of wooden railways is that the locomotive shall be light, and also the loads carried. Good broad faced wheels are also essential. Such roads are considerably cheaper than plank roads in first construction, and also in maintenance. Wooden railroads can be constructed in some localities for the small sum of $1000 a mile. The exhibition of a very little united spirit and energy among country neighbors would put their towns and villages into railroad communication with the principal through lines of travel.

Our attention has been called to this subject by reading the accounts of a projected wooden railway from Carthage, N. Y., to Harrisville, a distance of 47¼ miles. The rails are to be of maple, strongly wedged into heavy cross ties, and the expense of the superstructure all complete is estimated per mile as follows:—

1,760 ties delivered, at 10 cts.	$176 00
21,120 ft. B. M. maple rails delivered, at $15.	316 80
Wedges delivered, say	40 00
Notching ties and track laying	467 20
Total	$1,000 00

The solid maple rail 4x6 inches, wedged edgewise every three feet into heavy notched ties, forms a track equal in strength to that of any other railroad, and is capable of bearing heavy rolling stock, provided the wheels have a rim five inches in width. Fine sand and dust, which get on the rail, is soon crushed into the wood by the car wheels, and forms a hard and gritty surface, which does not wear, and greatly facilitates the traction. The maple rail, if sound, will last a number of years.

A good deal of interest, we might say excitement, is now going on in Jefferson County, N. Y., concerning these wooden roads. Mr. J. B. Hulbert enjoys the credit of being the projector and engineer. A short road of this kind built by him, six miles long, has been successfully used for eight years. He is now constructing a wooden railroad 22 miles long, to connect the Clifton iron mines with the Otwegatchie railroad. Sixteen miles of the new road are nearly completed, and a portion is in actual operation.

Asbestos, a Material for Glass Making.

The use of asbestos is yet very limited. Having a certain flexibility and being completely incombustible, it was in ancient and modern times used for the manufacture of fire-proof garments. It has also found application in the old "chemical fire boxes," which were small flasks containing the asbestos moistened with oil of vitriol. Ignition was produced in pressing ordinary sulphur matches which were coated with a mixture of chlorate of pottassa and sugar into the asbestos. The chlorate being decomposed, oxygen was given off, which in combining with the combustible matter produced fire. To-day asbestos is solely employed for the making "papier maché," and in the laboratory of the chemist for filtering acids. Its use for fire-proof safes has been abandoned, other substances having been found superior. But another important use lately suggested itself to our mind—it is that for glass making, and the following we hope will justify our suggestion.

In its chemical composition asbestos is a silicate of lime and magnesia, in which the alkaline earths are more or less substituted by protoxide of iron and manganese, and the silicic acid, sometimes by alumina. In all these, one part of magnesia is substituted by water, this being very probably the cause of its peculiar fibrous state. It has been found to contain in its maximum 3 per cent of alumina and 1·12 per cent of oxide of manganese; protoxide of iron is varying in most species from 3 to 11 per cent, only the asbestos from Sitkaranda, on the Ladoga lake, contains, according to Hess, 19·73 per cent of this oxide. Serpentine and turmaline, though occurring in the form of asbestos, do not belong to that species, as they are of an entirely different composition.

Glass on the other hand is a silicate of lime and potassa or soda, in which the alkaline bases may be substituted either by baryta, lime, strontia, or lead, whereby we get different kinds of glass. The strontia glass is what is called coelestin glass, being like the baryta glass largely manufactured in England. Magnesia can, according to Dumas, be introduced into glass to the extent of 6·37 per cent, perhaps more; Venetian aventurin contains 4·5 per cent of magnesia, and a smaller amount of it is found in various other kinds of glass. Comparing the composition of asbestos with those, we are led to the conclusion that it would be best to use it as an admixture to the composition of green bottle glass, as the following analysis undoubtedly will show:

	Green bottle glass.	Asbestos in long fibers.
Silicic Acid	64·5	55·87
Lime	23·3	17·76
Alumina	2.7	..
Soda	3·8	..
Potassa	2	..
Protoxide of Iron	3·7	4·31
Protoxide of Manganese	..	1·12
Magnesia	..	20·33
	100·0	99·39

A glance at the above analysis will show us that the two most important ingredients, lime and silicic acid, are contained in both the bottle glass and asbestos in nearly the same proportions. The latter differs from the former chiefly in containing 20 per cent of magnesia but no alkalies. Now, supposing that 5 per cent of magnesia at least might be introduced into the flux, we may for the manufacture of bottle glass be able to mix about one part of powdered asbestos of the above composition with three parts of the common flux now in use for the specific kind. That this proportion must be varied according to the composition of the asbestos is self-evident. Some of it is probably worthless for the proposed purpose, owing to the large quantities of iron it contains. As, however, this mineral is of abundant occurrence here and elsewhere (there is a "mountain" of it at L'Original, Canada—see Scientific American of 16th June, 1866), it would certainly be worth while to give it a trial.

Preserving the Bottoms of Iron Ships.—Welch's preservative cement is the last of the many compositions tried in England for preserving the bottoms of iron ships. It is an elastic cement composed of certain stone grits and bituminous substances, and with this the ship's bottom is coated with a layer about 1-32d of an inch thick. When firmly set a liquid cement is laid on with a brush, and on this latter is transferred a metallic facing of copper-dust, a liberal dusting of the copper facing with fine stone grit completing the process. Two vessels partly coated with this composition just returned from a twelve-month's voyage to China were covered with barnacles except where the composition was applied which was perfectly clean and presented the appearance of bright copper.

Counterfeit Creosote.—A large proportion of ordinary creosote is simply carbolic acid. But the pure creosote, which constitutes the lachrymosal property and peculiar smell of smoke, is quite a different substance, and may be distinguished from the false, as shown by Rust, by its behavior with collodion. A mixture with this latter and carbolic acid gives a gelatinous precipitate, while with true creosote the collodion remains clear. Dr. Hager gives another test. To a weak solution of iron, a few drops of ammonia are added until the precipitate which originally forms is dissolved. Carbolic acid communicates a blue or violet tinge to the solution, while genuine creosote gives a green color, afterward turning to brown

Recent American and Foreign Patents.

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

STEAM GAS GENERATOR.—Hiram Maxim, New York city.—This invention relates to an improved method of generating gas from volatile oils for illuminating purposes, superheating the same and regulating the flow of steam by the pressure of the gas.

TELEGRAPH WIRE INSULATOR.—W. E. Simonds, Hartford, Conn.—This invention relates to an improvement in constructing insulators for telegraph wires, and consists in forming the glass, flint, or other insulated portion of the device independent of the peg by which it is connected with the post for supporting the wires, and so arranged in connection therewith that rain or the moisture of condensation shall not settle around the base of the insulator and furnish a medium for the escape of electricity from the wire to the ground.

BOX FOR AXLES OF RAILROAD CARS.—William Stowe, Hollidaysburg, Pa.—This invention relates to an improved construction of a box for containing grease for the lubrication of the axles for railroad car wheels, and consists in the arrangement of a sliding lid on the front of the box in such a manner that it cannot slip out or get loose, while it effectually shuts out the dust, and is very convenient and easily managed.

ARTIFICIAL LEG.—Charles Swett, Vicksburg, Miss.—This invention relates to an improved arrangement of devices for an ankle joint of an artificial leg, and consists in a combination of a vertical spring with horizontal india rubber plates arranged in such a manner that the foot may readily adapt itself to any required position when a step is made with the artificial limb, through the combined flexible action of the india rubber plates and steel spring, while by their elasticity the movement will be assisted and the foot will instantly resume its natural position when lifted from the ground.

SHUTTLE THREADER.—Lewis Ripley, North Chelmsford, Mass.—The object of the invention is to furnish a device for threading shuttles which shall obviate the old method of drawing the thread through the eye of the shuttle by suction with the mouth, which is attended with unpleasant and deleterious effects by inhaling dust and fiber into the lungs of the weavers.

BLEACHING AND STAIN REMOVING FLUID.—Maria E. Tompkins, Brooklyn, N. Y.—This invention or discovery relates to an improved composition or fluid mixture for bleaching cotton, linen, or other textile fabric, and for removing stains of ink, coffee, tea, fruit, leather, mildew, and other discolorations.

GAS METER.—David Forrest, Eastport, Me.—This invention relates to an improved method of constructing meters for measuring gas, and the invention consists in operating a tubular shaft by the pressure of the gas, after the manner of a "Barker mill," and discharging the gas from the arms of the said shaft into a chamber and registering the same by the action of the shaft.

KILN.—W. H. Guignon and W. D. McDonald, Warren, Pa.—This invention relates to an improved method of constructing kilns for charring and carbonizing wood for charcoal and for making coke.

VELOCIMETERS.—Edward A. Lewis, St. Charles, Mo.—This invention relates to an improved machine whereby the velocity of running machinery may be measured, and the invention consists in an arrangement of wheels and eccentrics which are operated by the moving machinery in part, and in part by clock work, operating an index finger on a dial plate.

STOVE FOR HEATING AIR.—J. A. Marvin, Red Wing, Minn.—This invention consists in arranging a heating drum above the stove, which is connected with it by sundry vertical pipes through which the products of combustion pass, and an evaporating pan, and casing around the drum and flue pipes.

LAMP CHIMNEY CLEANER.—John H. Lightner, Shirleysburg, Pa.—The lamp chimney cleaner embraced in this invention is formed of a series of spring bands, curved or bent from end to end, and secured at each end to and about a common center stem or rod, in the same direction therewith, in combination with a slide or collar or ring, so applied to the said springs, when moved up or down thereon, it will compress such springs against the center rod or stem or allow them to expand therefrom, so as to more fully and perfectly adapt the implement to the size of the interior of the globe or chimney in connection with which it is used.

TOY FORTUNE TELLER.—Charles T. Ford, Essex, Mass.—This invention relates to a toy for telling fortunes, or answering questions, and consists of a revolving wheel having prophetic sentences on its periphery, at some one of which the hand of a figure points where the wheel is stopped. There are also numbers on the inner periphery of the same wheel, which relate to questions and answers to be found on the scrolls forming part of the toy.

LUBRICATING COMPOUND.—F. T. Allyn, New York city.—This invention relates to a new lubricating compound, which is made with a view to increasing the efficiency of the material, and to reduce its expense.

SAFE DOOR BOLT.—John R. Pierson, Newark, N. J.—This invention relates to a new manner of locking safe doors, so that the same cannot be opened by the insertion of wedges, or by blasting, but only when all the bolts are withdrawn.

CASTERS.—L. Frederick Cerf, New York city.—This invention relates to a new manner of constructing furniture casters, so that they will be strengthened and prevented from bending and breaking. The invention consists in forming a projection on the sleeve which fits around the pivoting pin, said projection sliding on the lower edge of the ring which is laid around the furniture leg, or on the lower edge of the leg itself.

ELEVATED RAILROAD.—Sylvanus Warren and Wm. M. Blume, New York city.—This invention relates to a new manner of constructing and arranging the rails as well as the cars of street or horse railroads, and consists, first, in arranging an elevated track upon one single row of posts, said posts being so formed that they will support both rails of one track. The invention further consists in the use of a truck, which runs upon the aforesaid rails, and from which the car is suspended by strong, wrought iron bars; the said car thus hanging down so as to be near to the street, and convenient for the entrance and exit of passengers, and so that it can be conveniently drawn by horses. The invention also consists in the construction and arrangement of a brake, by which all the wheels of the truck can be stopped at once, and whenever desired.

PLANING AND SLOTTING MACHINE.—Charles A. Meinhardt, Fort Wayne, Ind.—This invention relates to a new device, by which a planing machine can be quickly converted into a slotting machine, and *vice versa*; the said planing machine being so arranged that it can work on level, tapering, or round, convex, or concave surfaces. The invention also relates to such a manner of arranging the cutter that the same cannot be injured during the return stroke.

LOCKS.—E. P. Porter and G. W. Hallett, Waterford, Ct.—This is an improvement on former inventions by the same parties, and consists, first, in so arranging the catches, and cam-shaped pieces, or "lift-ups;" and second, the combination with the catches to the bolt of a series of lides, either more or less, in number so constructed and arranged as to be thrown into such a position as the key is turned, as will prevent the catches being swung back too far for the spring catches which hold them out of contact with the bolt, to properly engage with them therefor.

DRILL FOR TEETH.—H. F. Bryant, Marathon, N. J.—The design of this invention is to supply a desideratum always existing in the profession of dentistry, and never hitherto provided for, by the construction of an instrument by which the posterior and table surfaces of the molar teeth can be drilled and excavated for cleaning and filling with equal facility to the anterior or any other parts of any of the teeth.

FILLING BOBBIN.—Charles H. Fiske, Lowell, Mass.—The object of this invention is the improvement of bobbins used in weaving to hold the "filling yarn," and it consists in giving to them a peculiar shape to prevent the slipping of the "filling," which is apt to occur in the operation of weaving.

PAPER BAG.—David Manuel and Calvin F. Manuel, Boston, Mass.—This invention relates to an improved mode of making paper bags and consists in cutting the material out folding the edges together in such a manner as to make a conical bag with a flap cap or cover for securing whatever the bag may contain.

MACHINE FOR DRIVING POSTS.—C. F. Fitch, Harbor Creek, Pa.—This invention relates to improvements in a machine for driving fence posts.

COOKING STOVE.—H. Stickney, Reno, Pa.—This invention relates to the construction and combination of parts in cooking stoves.

BEEHIVE.—Arthur Gray, Kelley, Ohio.—This invention relates to a new and useful improvement in the construction of beehives whereby the temperature of the hive may be rendered uniform or nearly so, that is to say, cool in summer and warm in winter; the hive also kept in a clean state, and the bee entrances rendered capable of being varied in dimensions so as to prevent the egress of the bees and still admit air for ventilation, and also control the escape of the drones, and admit of the free egress and ingress of the "workers," as may be desired.

DRAFT ATTACHMENT FOR HORSES.—Elias Sanford, Meriden, Conn.—This invention relates to a new and improved draft attachment for horses, whereby the use of traces is avoided and a central draft chain employed similar to that used with a yoke and cattle. The object of the invention is to overcome the difficulty attending the plowing of orchards with horses, to wit, the stripping off the bark from the trees in consequence of the ends of the whiffletrees coming in contact with the same.

MACHINE FOR ORNAMENTING BUTTONS.—John Tunnecliff and Patrick Cahill, Northampton, Mass.—This invention relates to a new and improved machine for cutting sinuous grooves in buttons manufactured of vegetable ivory and other materials which will admit of being cut or grooved. The object of the invention is to ornament buttons in this style in an economical and expeditious manner.

ATTACHMENT FOR THE KEY BOARDS OF MUSICAL INSTRUMENTS.—Eben Tourjée, Providence, R. I.—The object of this invention is to obtain, by a very simple and inexpensive means, an attachment for the key boards of musical instruments which will admit of the "touch" being increased or diminished in force as the performer may require, in order to assist in strengthening the fingers.

ROOFING.—R. P. Henry, Akron, Ohio.—This invention relates to a new and improved means for keeping the joints of board or plank roofing perfectly tight and weather proof, and it consists in paving the joints of the boards or planks covered by a sheet metal strip the edges of which are bent down and fitted in grooves in the boards or planks, vertical plates or break waters being also inserted in the grooves and the whole covered by a wooden batten, whereby a perfectly weather-proof roof of the kind specified is obtained.

ANIMAL TRAP.—J. W. Churchill, Pittston, Pa.—This invention relates to a new and improved animal trap of that class which are commonly termed self setting and it consists of a peculiar construction and arrangement of parts whereby a very simple and efficient trap of the class specified is obtained.

CAST IRON CAR WHEEL.—George Peacock, Selma, Ala.—This invention relates to an improvement in car wheels and consists in constructing the wheel with arms or spokes extending from the rim to the hub of the wheel fortified by a curved plate extending from the thinner or outside edge of the rim or tread of the wheel nearly to the hub, not united with it but leaving spaces between the arms or spokes of the wheel around the hub, whereby a current of cold air can be thrown around the hub as well as through the eye when cast, and on as much of the body of the wheel as may be necessary to produce an equal cooling and secure uniform contraction in the periphery and body of the wheel.

PAPER VESSELS, ETC.—Agustus Jennings, and Isaac Jennings, Fairfield Conn.—This invention has for its object to furnish an improved manner of forming or giving the desired shape to vessels and other articles made of water proof paper.

CORN PLANTER.—James M. Gordon and E. Christianson, St. Joseph, Mo.—This invention has for its object to furnish an improved corn-planter simple in construction effective and accurate in operation and which shall mark the hills so that planting may be done with convenience and dispatch and without its being necessary to previously mark the ground.

PLOWS.—Chas. Forster, Lebanon, Pa.—This invention has for its object to improve the manner in which the cutter and landside of plows are connected to each other and to the standard and mold board so as to make the connection stronger firmer and more secure.

ELEVATOR.—Ezra N. Curtice, Springwater, N. Y.—This invention relates to a device for elevating hay, grain or straw into place on top of a wagon as desired.

FRUIT BOX.—Henry B. Wilcox, Toy Mills, Pa.—This invention relates to a new manner of constructing polygonal fruit boxes, and consists in so providing and arranging the side boards, that the bottom is held between the same and is prevented from moving up or down, without projecting beyond the outside of the box, the whole box is or may be made of paste-board; the bottom and sides being perforated to allow proper ventilation.

UTERINE SUPPORT AND TAMPON.—August C. Rohleder, New York city.—The object of this invention is to arrange an apparatus which may be used as a tampon or shield to prevent the escape of blood from the uterus, for the purpose of stopping hemorrhage and also for other purposes; said apparatus being so arranged that it can be easily converted into a very effective pessary and support for the uterus.

ATTACHING MATCH HEADS TO THEIR MANDRELS.—Edward Myers, Cincinnati, Ohio.—The object of this invention is to attach a matched head to its mandrel in such a manner that it may be applied and detached with the greatest facility so that when it is desired to use the entire width of the machine for planing or surfacing, the matched head may be detached without any trouble or difficulty whatever, the mandrel remaining fixed or stationary.

STOVE DAMPER.—E. T. Duke, Plattsmouth, Nebraska.—This invention relates to an improvement in stove dampers, and consists of two flat rings, hung by means of loops at the extremities of the conjugate axis of an elliptical center plate, through the transverse axis whereof passes a square key or shaft.

MEDICAL COMPOUND.—S. Payne, Louisville, Ky.—The present invention relates to a new and improved medical compound, especially designed for the cure of hog cholera.

TOOL.—E. S. Fisher, Boston, Mass.—The present invention consists in so constructing a pair of durders such as are used for spacing off work upon metal, that it can be also used as a punch to prick, and thus mark the same, at one time, whereby much labor and time are economized.

REFRIGERATOR CAR.—J. B. Sutherland, Detroit, Mich.—This invention relates to an improved refrigerator car, and consists in such an arrangement of the internal fittings of a double-walled, double-roofed, double-floored car, as to insure a constant circulation of the air within the car, so that the warm air is conducted through ice chests, and thus cooled, returned to the body of the car.

COTTON AND HAY PRESS.—Barnabas B. Alfred, La Grange, La.—This invention consists in the use of a double screw, one end of which operates the follow block, and the other the press box, moving them in opposite directions.

APPARATUS FOR SPONGING CLOTH.—John R. Paul, Philadelphia, Pa.—In this invention the cloth is sponged by steam, applied through a perforated adjustable horizontal cylinder, around which the cloth is rolled.

MUSICAL NOTATION.—Virgil C. Taylor, Des Moines, Iowa.—This invention consists in a new method of indicating the key note to the eye, by making the line upon which it falls lighter, or, if it falls in a space, by making the space either narrower or wider, than the other lines or spaces of the staff.

CHURN.—Joseph J. Everst, Cumberland, Md.—This invention consists of a new form of dasher, a new device for operating it, and another operating in connection with the dasher, for the purpose of thoroughly beating and aerating the milk, and gathering and removing the butter from the churn.

GATE AND OPENER.—Theodore Munger, Jaynesville Iowa.—This invention relates to gates which open and shut by sliding horizontally back and forth, in a frame, and consists in applying to them a cord pulley and crank rod for the purpose of opening and shutting them, in a novel support for the crank rod, and in a peculiar latch or fastening operating in combination with the cord pulley and crank.

PORTABLE HOSE BRIDGE FOR STREET RAILWAYS.—A. L. Wilkinson, Huntsville, Ala., and E. Y. Beggs, Nashville, Tenn.—The object of this invention is to furnish a neat portable device by which hose lying across the tract can be bridged over so that the horses and cars will be enabled to pass it without inconvenience, and without damaging it.

WAGON.—Henry [illegible], Leesburg, Miss.—The present improvements are applicable to wheelbarrows, carts, drays, wagons, railroad cars, etc., and consists principally in the application of a round revolving axle and bed plate, also, in furnishing both sides of the wheel hubs and boxes, similar to each other. The axles are turned off of a uniform size, with flanges to adjust the wheels to their proper places, on which axle nuts are screwed, for securing the wheels, as in ordinary vehicles.

CIGAR LIGHTER.—J. W. Tracy, St. Louis, Mo.—The present invention relates to a cigar lighter, which consists of a figure or ornament which is intended to sit on a counter or other suitable place in a saloon, etc., and is so constructed and connected with a gas pipe as to allow a small flame to be kept constantly burning, which will be increased as the figure or ornament is lifted to light the cigar.

Answers to Correspondents.

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

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

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

J. W. S., of Conn.—To mend your broken amber mouthpiece smear the surface with boiled linseed oil and hold them over the mild heat of a charcoal fire, pressing the parts well together until the lute becomes hard and solid.

T. U. A., of N. C.—A large part of so-called coral jewelry is prepared artificially from marble dust made into paste by a very siccative oil varnish or soluble glass (silicate of potash) and a little isinglass, and colored by Chinese vermillion. Sometimes genuine coral cuttings or dust is agglutinated and afterward molded into the various objects required.

S. P., of Mass.—Most of the hair dyes and also the indelible inks contain nitrate of silver. Cyanide of potassium will in most cases remove the stains or marks of indelible ink from linen, etc.

S. M. N., of Me.—It is generally believed that hollow walls for dwellings are much superior to solid walls, especially for buildings of brick or stone, as they are much better non-conductors of heat than when solid.

F. H., of Mich., asks if "water cleansed with sal. soda, enough to make it feel slippery, will scale the inside of a steam boiler?" We do not think that water containing that alkali will form a scale. The scale in boilers is usually formed by the salts held in solution by the water. Frequently these suspended matters are of such a nature as to have a great affinity for the iron, and being separated and deposited by the heat form a coating on the interior of the boiler. One cause of the foaming of new boilers is the union of the oil, or other grease used in building the boiler with the alkalies held in solution by the water. Anything of a mucilaginous nature put into a boiler will cause it to foam. Even a small quantity of sugar will produce this result. The best remedy we know of for foaming is frequent blowing off.

J. G. W., of Pa., alluding to our notice in the SCIENTIFIC AMERICAN of Nov. 23, of a water wheel, the builder of which states it can be driven by the water passing through a two-inch pipe, asks why a pump could not be attached and driven by the wheel to return the water and thus the wheel be self propelling. He thinks it would work. We differ somewhat from this opinion. Similar propositions are almost daily suggested by correspondents to this office. J. G. W. had better study natural philosophy before he makes any expensive experiments in this direction.

Business and Personal.

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

Pattern Letters and Figures for inventors, etc., to put on patterns for castings, are made by Knight Brothers, Seneca Falls, N. Y.

Inventors and Mechanics interested in the wonderful process of reproducing oil paintings by mechanical means should order our "Journal for Popular Art," the first number of which will be mailed free. Address L. Prang & Co., Boston, Publishers of "Prang's American Chromos."

Wanted—A second-hand low-pressure engine of about sixty horse-power. Address A. Catchpole, Geneva, N. Y.

Parties wishing to purchase good second-hand Portable and Stationary Engines, from four to fifteen horse-power, apply to Abram Logan, Tideoute, Pa.

Orrin Lane, Vermont, Chaut. Co., N. Y., wishes to know where he can get a Gage Lathe to turn all kinds of chair stuff.

For sale in Richmond, Va., the tools of a small Brass Foundery and Finishing Shop, Lathe Tools, Furnaces, Flasks, Patterns, etc.; will be sold at a sacrifice on early application. Address Finisher, Box 92, Richmond, Va.

Manufacturers of alcohol and whisky stills, send descriptive Circular and price list immediately to W. C. Tucker, Columbus, Miss.

Inventors and Manufacturers of Agricultural, Mechanical, and other useful machinery, are requested to send Catalogues or Circulars, with price list, to Mr. I. W. Sperry, 113 West 26th street, N. Y. city.

Mans, White & Co., Hazleton, Luzerne Co., Pa., wish to correspond with parties manufacturing fire brick for stoves.

Wanted to purchase—set bolt machinery suitable for carriage bolts. Address Robert Miller, Perth, Lanark Co., Ont., Canada.

Wanted—a hub mortising machine, new, or second-hand if in good order. Address Box 1439, Philadelphia, Pa., with description and price.

Columbus Iron Works Co., Columbus, Ga., wish to know where they can purchase a good machine for heading bolts. Also, a good Machine for centering and straightening shafting ready for the lathe—from 2 to 6 inch shafting.

I wish to communicate with parties having the best patent for making ice, of one or two thousand pounds capacity a day. S. P. Holbrook, Box 2208, Boston, Mass.

Names of parties using steam wanted by H. N. Winans' Anti-Incrustation Powder, 11 Wall street, N. Y., to prove by circular the value of clean boilers, his 12 years experience being authority on the subject. Three postage stamps returned to pay for trouble.

I want to arrange with a good Machinist to manufacture a Patent Printers' Chase, to do away with "Furniture." By this invention the smallest quantity of "matter" may be imposed in any part of the largest chase ever made, and will require no more "furniture" than for the smallest chase. Locks up with quoins. No screws. Address Richard Yeomans, Printer, Cincinnati, Ohio.

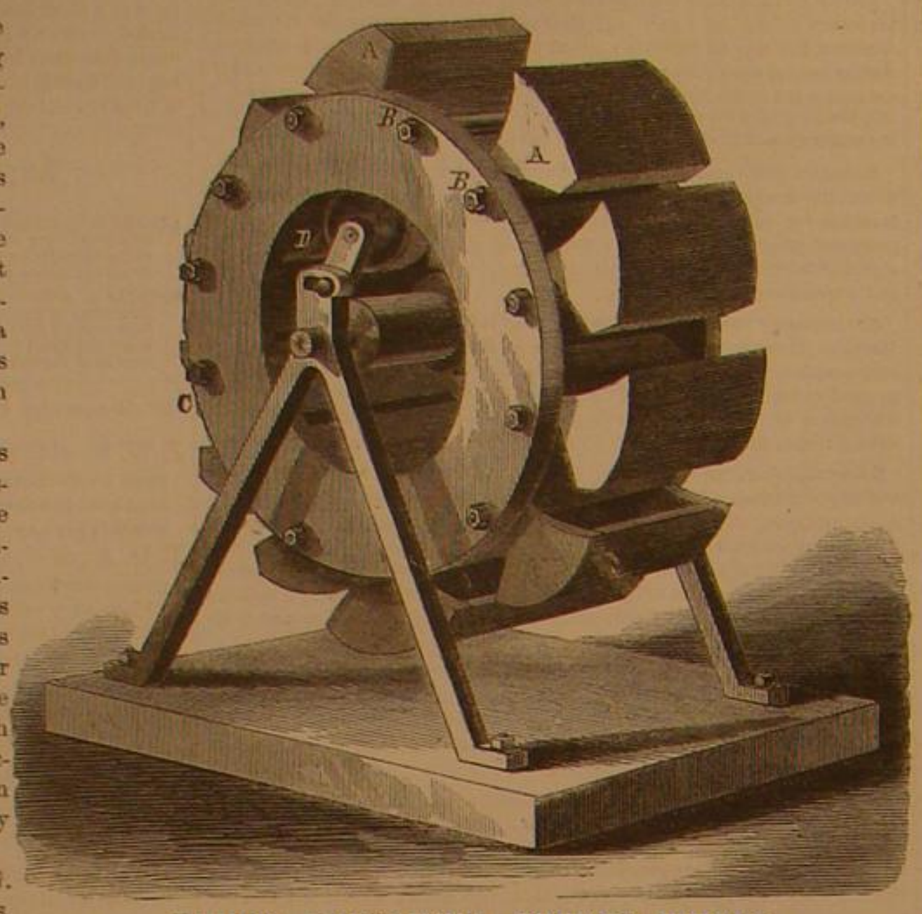
Wanted Immediately—Address of all Manufacturing Companies in United States—especially of Tin and Plated Ware—for entirely new articles of Manufacture. Jno. I. D. Bristol, Detroit, Mich.

Improvement in Overshot and Breast Wheels.

The object of this improvement is to promptly empty the buckets of a water wheel when the water has done its work and to retire the ascending buckets inside the wheel rim to escape the weight of the atmosphere and reduce the weight of the ascending body. The frame of the wheel is made in the usual form, but the buckets, instead of being rigidly secured to the rims, are hung on pivots which permit a partial rotary motion. The buckets, A, are made quite deep and pivoted at each end to the sides of the wheel. The bolts, B, serve a double purpose, one to hold the sides of the wheel firmly together, and the other to sustain the buckets when in position to receive the water. The buckets are so hung that when they have passed the lower center and rise on the ascending side at C, they fall in toward the center of the wheel. To the bottom of each of them is affixed a curved arm —one seen at D— which passes through a slot or mortise through the rim of the wheel, and as it comes up to the top impinges on the shipping wheel or roller, supported on a stand fixed to the frame. This stand is adjustable by means of a stud in a slot in the main frame.

The bolts against which the buckets rest are covered with india-rubber the elasticity of which relieves the fall of the buckets as they resume their working position. The inventor says that the great advantage which this wheel has over others is that the buckets work by the natural laws of gravity, neutralizing the action of air and weight on the upward portion of the revolution and receiving the benefit of both on the downward portion, thereby reducing the quantity of water required. It can be manufactured cheaper than the ordinary wheel and works simply and effectively.

It was patented June 11, 1867, by E. G. Budd, who may be addressed at Budd's Lake, Morris county, N. J. He will dispose of the whole invention or will sell state and county rights.



BUDD'S REVOLVING BUCKET WHEEL.

ROWELL'S PATENT DOUBLE-TEETH GEAR, FOR CLOTHES WRINGERS, ROLLING MILLS, AND PLANERS.

That weekly annoyance, washing day, is a severe trial of the good temper of every member of the household, from those who perform the labor to those who witness its discomforts. Probably no device yet contrived has done more to lessen these annoyances and discomforts than the clothes wringer. It greatly diminishes the labor and expedites the work. Soon after the introduction of the Universal Clothes Wringer, which was the pioneer of these labor-saving implements and was first used used without cog wheels, it was ascertained that the rubber rolls were too short lived, owing to the want of an absolute connection between the two; the roll to which the handle was attached having not only to pass the clothes through the wringer, but by its friction to revolve the other. Hence the necessity for "cog wheels" to make an absolute connection between the two, so that they would revolve independently of the friction of the rubber. Still there was an obstacle to the perfect operation of the geared wringer, inasmuch as the distance to which the cog wheels could be separated without coming out of gear, in wringing thick clothing, bedding, etc., was very limited. It became necessary for the geared ends of the shafts to be so arranged as to prevent the cogs from separating too much, and a device known as a "stop gear" was applied. This was a pin on the journal of the upper roll to limit the amount of opening on the geared end. Of course all the separation of the rolls beyond that limit must occur on the opposite end. Thus the departure from parallelism in the axes of the rollers more or less cramped the gears and prevented their proper action.

The remedy for this evident defect has been supplied by the device represented in the accompanying engraving. It is the invention of Dr. Warren Rowell, and was patented Sept. 3d, 1867. This gear is double, or may be made triple if needed, thus requiring fewer teeth, while the amount of retrocession is greater than with any single gear and the working of the teeth is smoother and more even. The laying out of the teeth is according to strict geometrical rules, and doubling the teeth increases the strength as well as the capacity of the gear, as by the teeth alternating they come in contact as often as if they were twice as fine. Wheels thus constructed can be made of one-and-three-quarters of an inch diameter and yet be separated four-tenths of an inch without slipping gear, propelling each other as well as when closed. We have seen a set of gears with only five teeth each, modeled by Dr. Rowell, which worked as perfectly under all circumstances of close contact and expansion as though they had fifty or a hundred teeth; a three-wheeled model of this diameter separated three-quarters of an inch and yet was in fair working contact with its fellow. The Doctor applied this device to a rolling mill some years ago and it worked so well that he conceived the idea of its valuable application to the common wringer. It is hereafter to be used on the Universal Wringer to the exclusion of every other gear. The ring between the sections of the gear strengthens the teeth, and being, like the teeth, beveled, the gear is kept working in the same path under all circumstances. It is applicable to wood planers or rolling mills as well as to wringers.

Communications from interested parties for the wringer may be addressed to R. C. Browning, 32 Cortlandt street, New York, and for the use of the gear for other purposes apply to the Metropolitan Washing Machine Company, Middlefield, Conn., or to the inventor, 23 Rutgers street, New York.

New Gold and Silver Ore Machinery.

Some time ago we chronicled the grant of patents to Mr. M. B. Dodge, for machinery for working gold and silver ores. The patents were obtained through the Scientific American Patent Agency. We are pleased to learn that these inventions are now in successful operation in the distant mountains of Idaho; also, in the nearer regions of North Carolina. From the assays made of the ore before working, and of the tailings after working, the mill is found to take out ninety per cent of the gold, which netts the company—the Empire Gold Mining Company of North Carolina—a large percentage over the expense of mining and milling the ore.

One of the Dodge mills for silver has recently been put up in Flint district, Idaho. Dodge's Improved Furnace for calcining and chlorodizing Silver Ore is also in use there, and late news from the superintendent states that it has proved a great success, being far in advance of the old mode of working. These improvements are manufactured by the Holske Machine Company, No. 528 Water street, New York city.

Purchase of St. Thomas and St. John.

The negotiations by the United States Government for the purchase of the islands of St. Thomas and St. John, from Denmark are stated to have been completed. The sum to be paid is seven million dollars in gold or nearly ten millions in currency. The New York *Herald* says that a detachment of troops and military officers have already gone to take possession.

The Danish West India islands heretofore comprised St. Thomas, St. Croix or (Santa Cruz) and St. John or (St. Jan). The island of St. Thomas is situated about forty miles east of Porto Rico, in latitude 18 degrees 20 minutes north, longitude 64 degrees 15 minutes west. It contains an area of forty-five miles of rugged and well elevated surface, though there are no very high mountains. It is seventeen miles in length by about five miles in breadth. At one period it was well wooded, but the timber has been cut from year to year, which has militated against its agricultural qualities to a considerable degree, laying the surface bare to the tropical rays of the sun, which has had the effect of drying up most of the springs that once irrigated the land. The soil is sandy, and a great portion is entirely uncultivated, only about twenty-five hundred acres being planted with sugar cane, which produces sugar of an excellent quality. There is an extensive trade at the town of St. Thomas, much of the produce of the neighboring islands being sent there for shipment to Europe. It is also the principal station of the West India and European mail steamships, and some three thousand vessels annually visit the island, in the course of mercantile trade. The flags of most of the principal European nations are to be seen floating from the consular agents', and altogether St. Thomas is a somewhat brisk and thriving seaport. It is unquestionably the best location, besides Havana, for a naval station, to be found in the whole West India group. The population is thirteen thousand souls. The United States and South American packets all stop at St. Thomas, connecting with the European packets. Good dockage is afforded for merchant ships, and many have their repairs made at that port. The port is known to its former Danish owners as Charlotte Amalie, and is picturesquely built upon three hills or spurs of a mountain which is at the back of the city. Its harbor defences comprise two water batteries and the citadel of Christian Fort. There is an English colonial bank and a local bank in the city; a Lutheran, Dutch Reformed, an English Episcopal, a Catholic, and Moravian churches, besides a Jewish synagogue. Slavery is still in existence on the island, but the slaves are not numerous, being about one to every five whites.

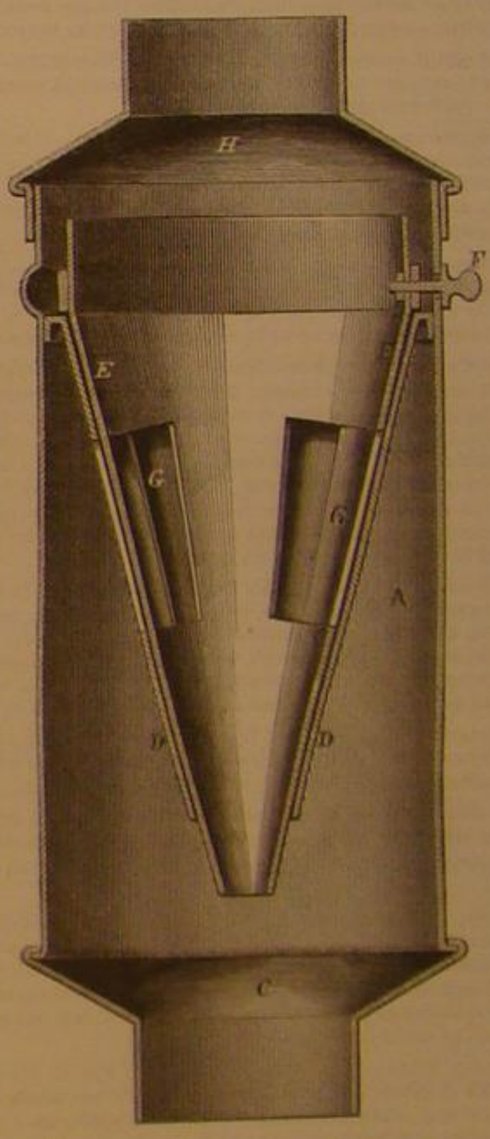
The island of St. John or (St. Jan) is but a few miles east of St. Thomas, containing an area almost equal to that of the latter island. The population is similar to that of St. Thomas, but numbers less that three thousand, most of whom are to be found in the town of Christiansburg. The products are the same as those of St. Thomas.

It is safe to predict that Yankee enterprise will before many years lead to a better development of the resources of both of these islands.

WEBSTER'S DAMPER DRUM FOR STOVEPIPES.

There can be no reasonable doubt that much of the heat evolved from our stoves calculated to warm rooms is wasted by the imperfect combustion of the fuel and by the too rapid escape of the heated gases. In the ordinary stove, range, or furnace as soon as the fuel is ignited the products of combustion go up the chimney, merely disposing of a very small proportion of their heating capacities in their rapid upward progress. The design of the device shown in the engraving is to delay this progress, thus utilizing the heat otherwise wasted, without impeding the draft.

A is an enlarged section of the stovepipe from eight to fourteen inches diameter and about two-and-a-half feet long. To the upper end of the cylinder is attached a cap, H, with which the pipe leading to the chimney is connected, and to a similar base, C, the pipe leading from the stove is fitted. D is an inverted cone the base of which is securely riveted to the upper part of the drum. E is a similar inverted cone fitting in the cone, D. To the base of E, is riveted a band which rests and slides upon the base of the outer cone and by which it is suspended. This cone may be partially rotated by means of a handle, F, passing through a circumferential slot in the cylinder. Both the cones have openings, G, in their sides, so arranged relatively one to the other that by moving the handle, F, they may be either entirely closed or opened. These act as dampers to the draft of the stove. The points of the cones are cut off to allow sufficient draft through the opening to insure combustion, even when the apertures in the sides of the cones are closed. This lower opening and the inclines of the cones allow the ashes, sparks, and soot that may be carried up by the draft to fall back into the stove instead of being carried into the chimney.



Patented through the Scientific American Patent Agency Nov. 5, 1867, by Eben Webster, who may be addressed relative thereto at Holland, Mich.

In 1794, Robert Patterson, of Philadelphia, Pa., received the Magellanic Gold Medal of the American Philosophical Society for his improvement in lightning rods. The object of his improvement was to prevent the points of lightning rods from being melted by the electric stroke. The invention consisted in the use of a point made of plumbago, which is capable of enduring an immense heat without melting. Robert Patterson also suggested the use at the base of the rod in the earth of a quantity of charcoal as being a good and enduring conductor of electricity.

Scientific American.

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VOL. XVII., No. 24....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, DECEMBER 14, 1867.

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BURNING OF A MAIL CAR.--DESTRUCTION OF SEVERAL THOUSAND COPIES OF THE SCIENTIFIC AMERICAN.

On Wednesday night, the 27th inst., a kerosene lamp exploded in a mail car, in Jersey City, setting fire to the mail bags, of which there were about thirty, all containing newspapers. Twenty of these bags were destroyed. and with them several thousand copies of the SCIENTIFIC AMERICAN of the last issue. We have provided for this loss by having a new edition printed. As it is impossible for us to know who of our mail subscribers may be deprived of their paper, we desire that those who do not get last week's issue (No. 23) will write for it, and it shall be supplied by return of mail.

Other publishers have suffered from the same accident, but we hope not to so great an extent as ourselves. Who will invent an inexplosive kerosene lamp?

MECHANICAL ENGINEERING IN THE UNITED STATES.

Under the heading "Why not go to America" a late number of *Engineering* attempts to enlighten its readers in regard to the state of mechanical engineering in this country. It says: "With respect to mechanical engineering, engine factories and kindred establishments are, of course, neither so numerous nor so extensive as here. And none employ anything like the number of draftsmen to which we are accustomed in such factories. A single draftsman is commonly reckoned enough for a large locomotive factory or an extensive railway workshop, and his duties are confined chiefly to making large scale skeleton drawings for fixing centers, etc. We have known large locomotive works, turning out a hundred engines a year, in which no transverse section of any engine existed, the position of the journals upon the axles, and other matters of a like nature being shown by cross marks on one-inch square wooden staves, of which a small bundle was laid away somewhere in the pattern shop or in the foreman's room. It will be underotood, therefore, that mechanical drawing is an art not very extensively practiced in the States, and the young engineer would be edified to see bow much is done by a few marks cut with a knife into a board, full size, by the "boss" (Yankee for master), and how much is left to the pattern makers."

We cannot believe that the editor of *Engineering*—himself of American birth and education—would consciously make a misstatement on this or any subject; but we are quite certain he is in error in regard to the practice in nearly all our establishments of any consequence.

The statements in regard to the practice of locomotive and railroad shops, and the duties of the single draftsman might have been made with a certain degree of propriety twenty years ago, but they certainly are neither applicable nor just now. We presume that the large locomotive works turning out one hundred engines a year which possessed no transverse section of an engine, was the one with which the editor of *Engineering* was connected when here, and it may be that it has not changed in its practice since; but it is doubtful if there are many others similar in this respect. The large locomotive or extensive railway shops which employ but one draftsman whose duties are chiefly to make large scale skeleton drawings we think are not very numerous, neither do we believe that sticks of wood with notches cut upon them are *generally* considered as reliable guides for setting up an engine.

A sight of the dirty and almost illegible drawings in every foreman's room would quickly correct the error that the work of the mechanical draftsman is not appreciated in this country. In shops of any pretensions whatever, the drawings of a machine are as necessary to the boss, if not to the workmen, themselves, as the tools with which the work is performed.

Still, it cannot be denied that too little attention is paid to the great preliminary work of drawing. Even now too many of our mechanics are content to correct the inexcusable errors of the draftsman in the pattern shop; and sometimes not even here is the mistake remedied, but the casting is made or the forging completed before the error is rectified. Some employers say they cannot afford to pay for first-class talent in this department, but probably they would find a pecuniary advantage in doing so, while it is certain an adequate compensation would stimulate our young engineers and draftsmen to qualify themselves more thoroughly than they at present deem necessary.

Every apprentice should be taught to work direct from the drawings without the intervention of patterns or models. In this way he would become accustomed to the calculations involved in drafting and fit himself for its practical study. We remember some years ago an extensive locomotive and stationary engine shop in Massachusetts, where perfect patterns of every part of the machine were furnished the forger and finisher as well as the molder. Nothing was to be done by the workman but to follow implicitly the lines and dimensions of the pattern, that for the forger being just enough larger than that for the finisher to allow for finishing. Of course, work thus done was purely mechanical and the workman improved only in one direction, that of skill in manipulation. This practice of furnishing patterns instead of drawings was found to be unprofitable and was subsequently abandoned.

UTILIZATION OF COAL DUST AND CULM.

A very large percentage of all the coal mined, whether anthracite or bituminous, is wasted in the processes of preparation for the market. Anthracite coal is very brittle, and during the processes of breaking and screening the angular particles fly off at the slightest touch. Bituminous coal, on the contrary, is quite soft, and by handling, the particles fall off as fine dust. To such an extent have these wastings accumulated in the vicinity of coal mines that one of our Pennsylvania exchanges informs us that the "owners of the mines have for a long time been put to their wits to know what disposition to make of this rapidly and continually increasing material. It was at one time proposed to bury it in the exhausted mines, but these it was found would contain but a small portion of it. Another proposition was to throw it into the river, but this was rejected, because of the fact that the channels of the rivers would have been obstructed. A third idea was to burn it, but this would have been the task of ages, so that the mine owners were compelled to abandon all the plans presented as impracticable, and look in other directions for the desired relief. It has now been ascertained that this 'culm' may be used for manufacturing purposes, and that it is successfully employed by some of the companies in the vicinity of the mine. But enough of it has already accumulated in the Lehigh and Schuylkill region to drive all the machinery of the world for a century, and this cumulative process is in continually uninterrupted progress. Experiments made with it some years ago at Albany demonstrated the fact that, with a little preparation, it could be used for all ordinary domestic purposes. It was, by the use of a liquid composition, formed into small bricks or cakes, and a fire made from this preparation, burned twenty-four hours, with a very slight perceptible portion of the mass being consumed."

From this statement some idea may be gathered of the immense amount of this waste, at present but little utilized. The accumulations of anthracite culm would be found to have suffered probably little deterioration in quality from the action of the weather; but the bituminous coal dust will part with a large proportion of its hydrogen, which, however, may better fit it for useful manufacturing purposes. Undoubtedly, furnaces can be constructed which would burn coal dust as easily and economically as the larger coal is now burned. Indeed, such furnaces are now in successful use; but the inconvenience and expense of transportation of the dust seems to be a serious obstacle to its general introduction. That it has been manufactured into cakes or lumps convenient for transportation and for use would seem, however, to prove that it is possible to turn this hitherto useless waste to good account. We believe that fine coal, properly managed, can be burned with more economy than large lumps, as the oxygen has a chance to reach the whole substance sooner than when in a large mass and the combustion is, therefore, more perfect and attended with less loss of heating gases. Perhaps this fact is not applicable to coal dust, which lies very compact, but some device for introducing the oxygen and permeating the whole mass could easily be contrived.

THE EXPOSITION'S EXIT.

This grand hobby of an Emperor quietly closed its seven months' existence on the 4th day of November last. The event was deemed of so little consequence that not even a cable telegram came to inform us of it, and our foreign files make but brief notices of the cessation of this latest and largest world's show. In them we read of no popular parade rendering the demise imposing, the only ceremony being the simple one of turning out the gas and the people. During its last days the whole palace seemed more than ever converted into a grand sale-booth, nearly every article of merit or value being ticketed with labels, big and little, bearing the one word "*Vendu.*" Such articles as were not thus or otherwise disposed of have been packed up preparatory to removal, the operation being conducted under the strictest governmental surveilance, no one entering or leaving the building without producing the pass-card furnished by the authorities.

A curious fact made public in connection with the close is that the Exposition actually comes to an end before all the catalogues have been published. The vastness of the exhibition has quite outrun all efforts to appreciate the value of the contents, and the innumerable special correspondents who have attempted to give to their journals anything like a detailed account of the wonders therein assembled will not find their occupation closed with the Exposition, but for some time to come must draw material from their note books and liberally on their imagination before their labors will all faithfully have been performed. It will be a great curiosity to have one of the catalogues of a non-existent collection when M. Deuter gives them to the public, but the intrinsic value of such publications, for either their original purpose or as light reading, will hardly be very great.

The Imperial Commissioners have published in the *Moniteur* a note explaining the cause of delay in distributing the medals awarded in June last. Wishing to give to each medal a special personal character, they decided to place the name of the exhibitor in relief thereon, and this necessitated the making of a die for each of the sixteen thousand recipients. The gold medals were to have been distributed from the 15th to the 30th of November; the silver medals from the 5th to the 31st of December, and those to whom bronzes were awarded will receive the same between the 15th day of January and the 20th of February, 1868.

An approximate calculation has been made of the aggregate amount of receipts during the Exhibition. For entrance fees at the wickets $2,000,000 was taken in: for season tickets, $160,000: and to these amounts are to be added large sums resulting from the sale of privileges, in the aggregate not less than $800,000 to $1,000,000. The Imperial Commission, or rather the company to whom the concession was made, has therefore received in all considerably more than $3,000,000, a sum greatly in excess of the expenses of the enterprise, for the guaranteed fund only represented $300,000.

In commenting on this last "world's exhibit," our English neighbors are drawing many useful lessons, and while indulging in no very laudatory terms at the employment of French eyes for viewing English goods, and chagrined at not carrying off more laurels, they have come to the sage conclusion that in many of the arts of life their nation is not so completely the salt of the earth as they fondly imagined, and that perhaps their salt, such as it is, is losing its savor. As for ourselves, it may be pardoned if we indulge in a little natural pride, considering the paucity, in number at least, of our display, and the large number of premiums which Americans carried off. Of this latter fact the disinterested public will for many months to come be reminded by the fortunate competitors who in a plethora of advertisements will for a long time proudly point to the high regard with which their various wares were held by the awarding committee, and facsimilies and full-size representations of the medals, ostentatiously posted, will greet our eyes on every side.

And now in bringing the series of descriptions, letters, and items with which from time to time we have attempted to give our readers some conception of the vanities of the world in the Exposition assembled, and recording at last the unlamented desinence of the whole enterprise, the old apothegm seems an appropriate epitaph:

Sic transit gloria mundi.

THE BERGEN NITRO-GLYCERIN EXPLOSION.

The fact that another terrible accident has resulted from the careless handling of this explosive, has been made known by the public press generally throughout the country; but the coroner's investigation, which is now being carried on in Jersey City, has furnished us with a more reliable account of the disaster than the hastily written reports, and the manifestly absurd explanations which have appeared in the daily papers. It appears that in making a deep railroad cutting, near South Bergen, N. J., the Central Railroad Company have been using glycerin, by preference, for powder. Late on the afternoon of the 25th ult., one of the employés who had charge of the blasting operations, entered a blacksmith's shop erected near the excavation, with a tin can containing about sixty pounds of glycerin, which had become partially congealed. With the intention of softening its contents, the can was placed in water, and the temperature of the latter was rapidly raised by plunging into it red-hot bars of iron, a mode of procedure in melting the glycerin. Exactly how the disaster was caused will never be explained, as all persons in the building miserably perished with it. In all probability, however, one of the bars came in immediate contact with the can, imparting such a high degree of heat to it as to cause the explosion of its contents. Such was its destructive force that no vestige of the blacksmith's shop remains, its site being as clear as if the building had been carefully moved away. The coroner's inquest, and the investigation incident thereupon, have not closed at we go to press, but from the testimony already given it would appear that the lives of the eight victims can be charged only upon the stupidity of a drunken employé, who paid his life as a penalty for his recklessness.

A PECULIAR AIR PUMP formed of two barometer tubes was lately to be seen in London. In it the ascending and descending mercury is made to perform the office of pistons, and by means of double valves at the top to exhaust the air from the bell-jar. The vacuum which resulted was declared nearly perfect, or greatly superior to the effect from the employment of the ordinary air-pump.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING NOVEMBER 26, 1867.

Reported Officially for the Scientific American

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71,261.—DEVICE FOR ATTACHING LAMP BURNERS TO LAMPS.—Joseph Bell Alexander, Washington, D. C.

I claim the application of the device for attaching lamp burners to lamp fountains, as described and set forth.

Also, the projections, H and H', in combination with the burner, A, and the notches, L and L', and the inclined planes, I and I', and the projections, K and K', in combination with the collar, D, or their equivalent, substantially as described and for the purpose set forth.

71,262.—CARRIAGE EVENER.—Chas. L. Ames, Bangor, Me.

I claim, 1st, The central adjusting plate, a, when constructed and combined with the evener in manner substantially as and for the purposes specified.

2d, The whiffle-tree adjusters, c c, when constructed and combined with the evener and whiffle-tree, substantially as described and shown.

71,263.—MACHINE FOR PLANTING COTTON SEED.—Jas. Armstrong, Bucyrus, O.

I claim, 1st, The principle of planting cotton seeds in the condition they come from the gin, by a machine conveying said seeds from the upper part of a hopper or case in longitudinal rows to the place of delivery at the lower end of said case, by means of brushes, picks, and inclined grooves circling around a revolving cylinder, as herein described, or any other substantially the same, and which will produce the same ends herein intended.

2d, The principal of expelling cotton seeds from the case or hopper of a cotton planter singly by the percussion of a spring raised on and striking from inclined planes, substantially as herein shown.

3d, The construction and combined method of operating the slide or cut-off, K, and the spring, N, by means of the lever, O, and the pivoted and forked lever, M, substantially as herein shown.

4th, The construction of the entire "cotton planter" machine, as herein described, for the purposes set forth.

71,264.—THIMBLE-SKEIN FOR AXLES.—William D. Baughn, Milford, Mich., assignor to himself, George P. Booth, S. D. Honowell and F. A. S. Burnham.

I claim the construction of a skein, whether of cast or wrought iron, or steel, as hereinbefore described, provided with the well or drop, C, the opening, D, to receive the oil, and the holes or openings, E E, etc., or their equivalents, for the purpose specified.

71,265.—SCROLL SAWING MACHINE.—H. L. Beach, New York city.

I claim, 1st, The saw straining spring arrangement, N F S P, in its combination and relative action with rod, R', crank shafts, C S and C' S' and saw, S, all constructed in the manner and for the purpose above set forth and described.

2d, The combination of saw, S, guides, G M G, and G', rod, R', sliding guide rods, G R, and G' R' cranks, C and C', crank shafts, C S and C' S', slotted pitman, P' I', and slotted connecting rod, C R, the whole combined, constructed and operating in the manner and for the purpose above set forth and described.

71,266.—HOSE COUPLING.—William G. Bedford, Philadelphia, Pa.

I claim, 1st, A coupling, consisting of a section, A, with a socket, a, shoulders, b, and lugs, d, d, and a section, A', having a tubular projection, a', lugs, e e, and shoulder, f, the two sections being constructed and adapted to each other substantially as described.

2d, The combination of the spring catch, n, on the socket, A, with the tubular projection, a', and its ratchet teeth, 11.

71,267.—STEAM ROTARY VALVES.—Louis Begon, San Francisco, Cal.

I claim the arrangement of the opening, b b, and two exhaust-passages, B B, in the conical valve, A, in combination with the ports, F F', G G', and exhaust-ports, H and H', in the case, C, substantially as described.

71,268.—LAMP.—Geo. A. Beidler, Chicago, Ill.

I claim, 1st, In combination with an annular oil reservoir, and an inner tube or air chamber for conducting air to the flame from below, a metallic wick tube, extending down into said air chamber, and so constructed and arranged as to operate as a conductor of heat, to rarefy the air in said chamber, and cause an ascending current therein, substantially as described.

2d, In combination with a tube or hollow case for conducting air to the flame from below, and a metallic conductor to convey heat down from the flame into said tube or hollow case, and rarefy the air therein, to cause an ascending current, I claim a glass globe or cup surrounding the flame, with apertures for introducing air within said globe or cup, and feeding the flame above the dome deflector, substantially as described.

3d, In combination with a tube or hollow case for conducting air to the flame from below, and a metallic conductor to convey heat down from the flame into said tube or hollow case, and rarefy the air therein, to cause an ascending current, I claim one or more perforated plates, so located between the base, where the air enters the tube or chamber and the flame, that the air must pass through said perforated plate or plates before reaching the flame, substantially as described.

71,269.—GAS STOVES.—A. L. Bogart (assignor to H. C. Bogart and J. P. Kennedy), New York city.

I claim, 1st, The combination of the burner, T, and vertical tube, C, with the funnel, F, pipe, H, trays, J L, openings, P, arranged substantially as herein described and for the purpose set forth.

2d, In parlor or heating gas stoves, the use of quick lime or other suitable chemicals in the trays, J and L, for the purpose set forth.

71,270.—STILL.—Geo. W. Bookwalter, Roanoke, O.

I claim, 1st, The flue, D, arranged substantially as described for the purpose designed.

2d, The drum, E, upon the pipe that conveys the steam to the condenser, or any similar device for the purpose described.

3d, The combination and arrangement of the still-boiler, A, the conduit pipe, B, the smoke stack, C, with the flue, D, and the drum, E, all arranged substantially as described for the purpose designed.

71,271.—FURNACE FOR ROASTING ORES AND OTHER PURPOSES.—Edward Brady and John Sloan (assignors to Edward Brady), Philadelphia, Pa.

We claim the construction of furnaces for melting ores, etc., making gas bake-ovens, and for other purposes, of the known forms, by the employment application and combination of metal plates, B, with the compartment, C constanly filled with water, all of which operate substantially for the objects set forth.

71,272.—CATTLE GUARDS FOR RAILWAYS.—Christian Brenneman, Orville, O.

I claim, 1st, The elastic gates, D D, constructed and used substantially as and for the purpose herein specified.

2d, The guide posts, A A, B B, and stop posts, H H, when used in connection with the elastic gates, D D, substantially in the manner and for the purpose specified.

71,273.—PEA SHELLER.—Wm. H. Bridgens, New York city.

I claim a combination of the box or frame, A, roller, R, portions, S S, of a hollow cylinder, and pins, P P, with or without a sleve, B, substantially as herein set forth.

71,274.—PIE RIMMER.—Neal N. Brown, Reading, Pa.

I claim the plate handle, A, with marker, s, at one end, and ears, B C, at the other, said ears being slotted, as described, securing the roller, E, by means of its journals and the roller, D, the whole being constructed and arranged together in the manner and for the purposes set forth.

71,275.—DITCHING MACHINE.—Clemens Bymer and John Imlay, Greensburg, Ind.

We claim, 1st, The wheel, F, with side flanges, F', and plough, G, in combination with the adjustable compressing plate, H, and spring, H2, substantially as described.

2d, The combination of the wheel, F, with side flanges, F', and the side cutters, I', substantially as described.

3d, The combination of the wheel, F, with side flanges, F', the side cutters, I', and the scraper and conveyor, K, substantially as described.

4th, The combination of the frame, A, caster wheel, B, and the adjusting mechanism consisting of the parts C, D and E, substantially as set forth.

5th, The combination of the frame, A, wheels, L, and axle, M, with the hinged rods, P, and the adjusting mechanism, consisting of the parts, O and N, substantially as set forth.

71,276.—STAVE MACHINE.—Francis O. Clark (assignor to himself and John E. Reininghaus), Benton's Port, Iowa.

I claim, 1st, The curved carriage, C, fitted into a channel of the table, B, in the relation to a dish saw, and flush with the top of the table, the said carriage and table constituting parts of a stave sawing machine, and the carriage being provided with head blocks, a clamping device, and the table with gages, all substantially in the manner and for the purpose herein described.

2d, The table, B, of a stave sawing machine, with a channel of curved form horizontally, and of a dove tail form vertically, cut down into it so as to form a depressed bed for the carriage, C, and also guides therefor, substantially as and for the purpose set forth.

3d, Jointing saws, mounted on inclined arbors, which are supported upon straight, moving-endwise, adjustable bearings, h h, which are operated by the devices shown, or the equivalents thereof, substantially as described.

4th, The jointing saws, mounted upon inclined arbors, which are supported upon straight, moving-endwise, adjustable bearings, h h, which are operated by the devices shown, or their equivalents, in combination with the vertically vibrating frames, j j, operated by the devices shown, or their equivalents, substantially as described.

5th, The combination of the straight, moving-endwise, adjustable bearings or frames, h h, carrying inclined arbors with jointing saws upon them, the toggle joint, formed of bent links, k' k', and the lever, k, for the purpose of adjusting the saws at any desired distance apart, without changing their angle of inclination, substantially as described.

6th, Providing for both adjusting the saws farther apart without changing their angle of inclination, and for changing the angle of inclination, when desired, in the one machine, by the means substantially as described.

7th, The adjustable clamp, c c', for accommodating one of the ends or different thicknesses of staves, in combination with the lever clamp, d', substantially as described.

8th, Making the bilge block both removable and adjustable between the clamps, d' e', for the purpose of bilging different lengths of staves, substantially as described.

71,277.—STAVE MACHINE.—Francis O. Clark (assignor to himself and John E. Reininghaus), Benton's Port, Iowa.

I claim the curved beds, s s', formed in the table-top, B, in combination with feed rollers, n n', p p', supporting roller, o, and cutter head, r, arranged as described, for the purpose of dressing curved staves.

71,278.—PORTABLE FENCE.—James M. Clark, Lancaster, Pa.

I claim, 1st, The dog-stake and pin, D E', in combination with the movable brace, C, and post, A, when constructed and arranged as and for the purpose specified.

2d, In combination with the above, the rider, H, as shown and described.

71,279.—ADJUSTABLE SPIRIT LEVEL.—Patrick Clifford (assignor to himself and James Doyle), Holyoke, Mass.

I claim, 1st, The graduated index plate, g, having the angular notches, p p, and central conical opening, g', in combination with the tapering spindle, u, and spring detent, k, the whole arranged and operating substantially as set forth.

2d, The adjusting pin, a', and screw, b, in combination with the revolving level case, F, and stock, A B, substantially as described.

71,280.—LAMP.—Theodore Clough, Dobb's Ferry, N. Y.

I claim the two lateral air jet pipes, in combination with the wick tube, arranged substantially as hereinbefore described and shown, and for the purpose hereinbetore set forth.

Also, the combination of the wick tube, lamp reservoir, two air jet tubes and the air supply tube, when arranged substantially as hereinbefore set forth so that the air supply pipe discharges into the upper part of the lamp reservoir, from whence the two air jet pipes receive their supply, whereby the top of the lamp is kept cool, and vapors and gases removed from the lamp reservoir and consumed.

71,281.—LAMP.—Theodore Clough, Dobb's Ferry, Greenburg, N. Y.

I claim, 1st, The combination of an air jet pipe with the wick tube of a lamp, when the air jet is so constructed and arranged as to be capable of discharging air under pressure, in a fine jet or jets, in the middle of the flame of the wick, just above the wick, substantially as described.

2d, The arrangement of the air jet pipe within the wick tube and lamp reservoir, when the reservoir is provided with a supply pipe, by which air is admitted to the upper part of the same, substantially as described.

3d, In combination with the air jet pipe and wick tube, an adjusting screw or its equivalent, whereby the position of the discharge aperture of the air jet pipe relatively to the wick and wick tube may be determined.

4th, The short tubular removable wick or section of wick, to be used with the stationary wick, substantially as described.

71,282.—BILLIARD CUSHIONS.—Hugh W. Collender, New York city.

I claim a new manufacture of strips for billiard table cushions, composed of layers of soft, vulcanized India rubber and two or more interposed layers of cloth, or other equivalent material, previously coated with India rubber, the whole united and together vulcanized, substantially as and for the purpose specified.

Also, as the second part of my said invention, vulcanized India rubber strips, for billiard table reversible cushions, of the form substantially such as herein described.

71,283.—WINCHES FOR CENTER BOARDS.—Henry V. Corbett (assignor to himself and Edgar S. Everts), Buffalo, N. Y.

I claim the windlass barrel, B B', and chains, D D', in combination with the center board, A, constructed, arranged and operating in the manner substantially as herein described.

71,284.—STEAMERS FOR COOKING.—M. C. Cronk, Auburn, N. Y.

I claim so constructing and arranging the tubes which pass through the several steamers, that various kinds of vegetables or meats may be cooked simultaneously without the fumes intermingling, as described.

71,285.—TRACE ATTACHMENT FOR WHIFFLE-TREES.—John W. Currier, Holyoke, assignor to himself and J. B. Gardiner, Springfield, Mass.

I claim the arrangement herein described for connecting the trace to the whiffle-tree, consisting of the combination of the parts, A and B, and spring, C, substantially in the manner and for the purpose herein set forth.

71,286.—BAG HOLDER AND FILLER.—Alonzo M. Darling, Davenport, Iowa.

I claim, 1st, The two distinct springs, F and G, sustaining and holding open the sack without fastenings, and leaving the space under the holder and around the sack free and open.

2d, The combination of a bag holder, as shown, with the turn table, B, all arranged substantially as and for the purposes set forth.

71,287.—PUMPS FOR FIRE ENGINES.—John N. Dennison and Roscoe J. Gould, Newark, N. J.

We claim the arrangement of rods, R S, in combination with the receiving or discharging valves of a pump, substantially as and for the purpose described.

71,288.—FIREPROOF SAFES.—Edwin A. Eaton and William Carlton Ireland, Boston, Mass., assignors to "Sanborn Steam Fireproof Safe Association."

We claim a water vessel for steam fireproof safes, in which the inlet and outlet tubes are constructed and arranged, and operate substantially in the manner and for the purpose set forth.

71,289.—CHURN.—Andrew N. Elzy, Placerville, Cal.

I claim a churn dasher with a central revolving shaft, B, carrying oblique arms, E, and square arms, G, alternating with each other and spirally arranged upon the shaft.

71,290.—TACK HAMMER.—Thomas Evans, Newark, N. J.

I claim a hammer head constructed with a socket, b, having openings in its sides, with spur projections therein for securing the handle when driven into said socket, substantially as shown and described.

71,291.—SPOOL SUPPORT.—Jesse Fewkes, Newton, Mass., assignor to Silver Lake Manufacturing Company.

I claim a spindle, b, pivoted loosely within its frame, A, in combination with a pin, c, or equivalent device, substantially as and for the purpose set forth.

71,292.—WINDLASS CRANK POWER.—J. H. Flemming, Groton Township, Ohio.

I claim the handle, A, having a loop or ring, B, and lug, G, and pivoted to the shell, C, arranged in relation to the ratchet, E, operating with said loop or ring, and in combination with the pawl and ratchet, substantially as and for the purpose set forth.

71,293.—TANNING.—Charles Frank, Cincinnati, Ohio.

I claim the tanning process or operation substantially as described.

71,294.—PLASTIC MATERIAL TO IMITATE WOOD AND OTHER SUBSTANCES.—Wm. B. Gleason, Boston, Mass.

I claim as a new manufacture, articles made in molds and under pressure of the ingredients specified, with or without the use of oil, substantially as described.

71,295.—SEEDING MACHINE.—E. H. Goelet and E. B. Goelet, Goldsborough, N. C.

We claim, 1st, The construction of the scraper and leveler, K L, with slot, c, tooth, J, and covering teeth, d d, arranged beneath a hopper box, having apartments, G G', rotary distributors, b b', and hinged bottom, H, substantially as described.

2d, The scraper, K L, with its tooth, J, and coverers, d d, slot, c, and inclined guards, I I, arranged beneath a cotton seed and a guano distributor, so as to operate substantially as described.

3d, The application of a drill opener, a scraper and leveler, a cotton seed distributor, a coverer, and a roller, to a frame, A, which is mounted upon two wheels, when these wheels serve as drivers and markers, substantially as described.

71,296.—LUBRICATING COMPOSITION.—Charles A. Granley, Rutland, Vt.

I claim the combination of tallow, soft soap, sulphur, antimony, and alum, in the proportions or their equivalents set forth, and using it as a lubricator for journals.

71,297.—FIRE BACKS FOR GRATES AND STOVES.—John Habermehl, Wheeling, W. Va.

I claim, 1st, The fire back of an open grate or fireplace, constructed of a fire tile, grooved or cut partly through, for the purpose of withstanding the action of heat, in manner as herein described.

2d, A concave fire back, constructed of fire tile in sections, so formed as to point to one center, to resist the expansion of heat, as herein described.

71,298.—PACKING AMMUNITION IN CHESTS AND BOXES.—Francis L. Hagadorn, Baltimore, Md.

I claim, 1st, The system of flexible or adjustable partitions, together with the bolsters, as described, or their equivalents, arranged substantially in the manner and for the purposes herein set forth.

2d, In combination with the above, I claim the compound or dovetailed wedge, substantially as described.

71,299.—LOOM.—Williams Hainsworth, Philadelphia, assign or to himself and Amos Gartside, Chester, Pa.

I claim, 1st, In combination with a series of leaves of harness, the endless cords and pulleys, connected and operating as described for the above purpose.

71,300.—FIRE-PROOF PACKING FOR SMOKE OR HOT-AIR FLUES.—Joseph B. Harris, Germantown, Ky.

I claim, 1st, A safety jacket for surrounding or inclosing any metal flue for conducting smoke or heat, containing an annular air space or series of air spaces, and an annular space or series of spaces packed with the fire-proof material herein described, the same being constructed and arranged substantially as herein set forth.

2d, Also, in a safety jacket or shield, to prevent the conduction or radiation of heat from pipes, stoves, furnaces, or fires of any kind to adjacent combustible substances, an intervening space packed with the fire-proof material herein described, substantially as and for the purpose set forth.

71,301.—GANG PLOW.—James Harris, Santa Clara, Co., Cal.

I claim, 1st, The rocking bar, E, to which the plows are attached, and by which they are turned over upon the frame.

2d, The elevating lever, F, the adjustable seat, I, the gage screw, J, the adjusting screws, K K, the lever rest, M, in combination with the rocking bar, E, as described and substantially as set forth.

71,302.—SAW FILING MACHINE.—Pascal Hatch, East Corinth, Vt.

I claim the combination as well as the arrangement of the series of files, a a, their frame, B, and machinery for imparting to such frame vertical movements, as described, with the frame, A, the platform, C, or its equivalent, and the saw carriage, D.

Also the combination and arrangement of the single file frame, B, and its series of duplex files, or the equivalent thereof, with the frame, A, and its two saw carriages, D D', applied to such frame, A, substantially as described.

71,303.—APPARATUS FOR ELEVATING BY HORSE POWER.—Wm. H. Hawley, Utica, N. Y.

I claim attaching to and combining with the ordinary draft rope and pulley or pulleys, the supplemental rope, E, and pulley, C, for the uses and purposes mentioned.

71,304.—FASTENING TOPS TO BUGGIES.—Henry F. Holt, Fredonia, N. Y., assignor to himself, T. C. Abbott, and F. B. Parker.

I claim the described arrangement of the horizontal and vertical shanks and sockets at the sides of the top and seat, in combination with the shank hook and socket and spring key at the back of the seat, in the manner and for the purpose set forth.

71,305.—DINNER PAIL.—David Howarth, Portland, Me.

I claim the arrangement in a dinner pail made as described, of the removable compartment, b, at the top, and the adjusting wires, f, as and for the purposes set forth.

71,306.—BASE-BURNING STOVE.—G. G. Hunt, Bridgeport, Ct.

I claim, 1st, The single wall cylinder, R, extending above the laterally extended chamber, C, and terminated within the fire chamber, A2, in a double wall chamber, through which air is admitted to the fire, substantially as described.

2d, The single wall cylinder, R, terminating in a double wall air heating cylinder, within the chamber, C, in combination with the flues or pipes, F, leading into the chamber, S, substantially as described.

3d, The combination of cylinder, R, chambers, C g and A2, descending flues, F, and chamber, S, when these parts are constructed and arranged so that they will operate as herein described.

71,307.—ALLOY FOR DENTISTS' USE.—M. M. Johnston, New York city.

I claim the use of sodium or potassium, or an alloy of either or both, for purposes above mentioned, in the preparation of amalgam or cement for filling teeth.

71,308.—RAILWAY SWITCH.—Charles W. Jones (assignor to himself and J. S. Jardine), Philadelphia, Pa.

I claim a safety switch composed of vibrating rails, A and B, fastened together by means of mobile cross ties, D D, point rails, P R and P' R', lever, L, and spring, S P, the whole combined, constructed, and operated in the manner and for the purpose above set forth and described.

71,309.—WATER PRISM.—Bart Kane, Cincinnati, Ohio.

I claim, 1st, A water prism consisting of the flanged end plates, A A' B C D b c d, glass plates, E F G, metallic binding strips, H I J, and one or more necks, a, for the insertion of stoppers, K, the whole being arranged and operating substantially as herein described and for the purpose explained.

2d, Also the triangular shaped and double flanged plate, A B C D b c d, when provided with the neck, a, for the object stated.

71,310.—MACHINE FOR PRESSING REINS.—Geo. H. Kendall, Springfield, Mass.

I claim the combination of the rollers, A and B, having the grooves, F, and projection, G, with folders, C and D, the parts being arranged and constructed substantially as and for the purpose shown,

71,311.—FOOT FOR TUBS, BUCKETS, ETC.—Joseph W. Kendall, Philadelphia, Pa.

I claim a metallic removable foot for tubs, buckets, casks, etc., etc., arranged, constructed and applied in the manner and for the purpose above set forth and described.

71,312.—NECK YOKE FASTENING.—Henry J. Lamm, Richmond, Ind.

I claim, 1st, The combination of the socket, A, shank, C, and neck yoke, B, when arranged to admit of the swivel action at each end of the shank, substantially as described and for the purpose specified.

2d, The open screw, b, the end, d, having a head, c, and the nut, D, for obtaining a swivel joint, when used in combination with the yoke, B, and shank, C, substantially as set forth and for the purpose described.

3d, In combination with the socket, A, and shank, C, the rubber band, I, substantially as set forth and for the purpose described.

71,313.—SELF-LUBRICATING JOURNAL BOX.—Philander P. Lane (assignor to Lane & Bodley), Cincinnati, Ohio.

I claim the self-lubricating journal box having the oil chamber, E, below the bottom of the journal, and communicating with the journal at or near its midlength, by one or more apertures, F, and at or near the ends thereof, by ducts, G y G' g, to which the overplus of oil is conveyed by the channels, H H', substantially as set forth.

71,314.—ORGAN AND MELODEON COUPLING.—Conrad Ling and George S. Chandler, Detroit, Mich.

We claim the combination of the bar, B, the spring, C, the sounding board, D, the guides, E, the blocks, F, the dog, G, hung upon the fulcrum, H, the levers, J, the supporters or guides, L, the sticker pins, M, provided with shoulders, O, the cleat, P, in conjunction with the action frame, A, the keys, N1 N2, and a proper stop, all arranged substantially as described for the purpose designed.

71,315.—DOOR KNOB.—Aaron Longstreet, Chicago, Ill.

I claim, 1st, The knobs, A B, having shoulders, S S, fitted to operate against the outer ends of rosettes, D E, and having shanks, H I, passing through said rosettes, and secured by the metal, G G, put in the annular grooves, m m, substantially as and for the purpose set forth.

2d, The knobs, A B, having shanks, H I, in combination with the loose spindle, J, rosettes, D E, arranged and attached to a door as herein specified.

3d, The bub, F, having a recess, P, in combination with spindle, J, knobs, A B, and catch, K, as herein described.

71,316.—CORK SCREW.—Samuel McCoun (assignor to himself and Lafayette Farrington), Stamford, Conn.

I claim, 1st, A corkscrew provided with a bore or vent hole, substantially as and for the purposes herein specified.

2d, The combination of the rod, C, with a cork screw, provided with a bore or vent hole, b, substantially as and for the purposes herein specified.

71,317.—CAR SPRING.—George W. McMinn (assignor to himself and Robert T. Reiley), Cincinnati, Ohio.

I claim forming a spring of two plates of metal, each of which is folded to make two layers of the spring, and shaped at or near its midlength and inner end respectively to form the end eyes or loops, A' B', and lips, d d', of the spring, as described and for the purposes explained.

71,318.—BUTTER WORKER.—Wm. C. Moser, East Nantmeal Township, Pa.

I claim, 1st, The machine as a whole, when combined, arranged, and operated substantially as shown and described.

2d, The shaft, C, paddles, D, vibrating arms, E, squeezer roller, F, uprights, G, and the handle, H, substantially as shown and described.

71,319.—TOP-SPINNING SWORD.—Wm. Mullally, Boston, Mass.

I claim a toy constructed in manner substantially as above described.

71,320.—ADJUSTABLE MIRROR.—Louis F. Neagle, Philadelphia, Pa.

I claim the mirrors, A and C, adjusting rod, D, vibrating rod, c, head, b, rod, d, set screw, f, pin, g, head, h, plate, k, and the latch, m, when combined and arranged as set forth.

71,321.—ANIMAL TRAP.—Geo. J. Parham, Harrodsburg, Ind.

I claim the spring, E, trigger, C, grated cover, D, revolving trap door, B, spool, G, pulley, H, and cord, M, all arranged in the manner and for the purpose specified.

71,322.—MODE OF TUNING BELLS, ETC.—Andrew Patterson, Birmingham, Pa.

I claim the manner, substantially as hereinbefore described, of tuning bells, so as to secure from them a higher or lower tone.

71,323.—MACHINE FOR MAKING TAGS AND LABELS.—Thomas Percival, Augusta, Me., assignor to himself, John D. Defrees, and Rollin Defrees.

I claim, 1st, The use in a machine for making tags and labels, of the punches m m, and the dies, n n, with movable bottoms, the same to be used alone or in connection with an inking apparatus for printing letters, numbers, or devices upon the tags or labels, all constructed and operating in the manner and for the purpose substantially as described.

2d, The use of the inking apparatus, F, in connection with a machine for making tags and tags and labels, operating in the manner and for the purpose substantially as described.

3d, The combination and arrangement of parts of a machine for making tags and labels, all substantially as described.

71,324.—BRIDLE.—Joseph A. Putt, Marlboro, Ohio.

I claim, 1st, The peculiar arrangement and combination of the blind, A, iron, C, cheek piece, B, and pin, D, the whole being arranged in the manner and for the purpose herein specified.

2d, The holes, b b b, in the cheek piece, B, when used for the purpose of obtaining an interchangeable bridle, substantially in the manner and for the purpose specified.

3d, So constructing a bridle that it may be changed from a blind to an open bridle, and vice versa, without changing the cheek piece, in the manner herein described and for the purpose herein specified.

71,325.—CAR BRAKE.—George Quick and John N. Wallis, Fleming, N. Y.

We claim, 1st, The brake rod, A, levers, L and M, the stands, H I J K, when constructed as and for the purpose specified.

2d, The cam slide, C, and latch, V, and key, Z, when constructed in the manner and used for the purpose above set forth.

71,326.—MACHINE FOR DRESSING STAVES FOR BARRELS.—John J. Ralya, Allegheny City, Pa.

I claim, 1st, A swinging bar, r, in a stave dressing machine, carrying a pinion to operate in connection with a toothed rake attached to the ram, in combination with a support, x, to hold the pinion in gear, and tripper, s', and pin, z, to throw it in and out of gear respectively, or their mechanical equivalents, substantially as above set forth.

2d, Adapting the direction of the action of the knives of a stave dresser to the crookedness of the staves by a lever, z attached to the head stock, in combination with a rigid arm, e', attached to the journal which carries the knives, and with or without the springs, e", substantially as and for the purposes above set forth.

71,327.—HARVESTER RAKE.—S. C. Ridgaway, Baltimore, Md.

I claim the compound crank arm, I, and cam, G, in combination with the rake, B, when mounted above the platform, and arranged to operate substantially as and for the purpose set forth.

71,328.—SIFTING MACHINE.—John J. Rink, Brooklyn, N. Y.

I claim, 1st, The arrangemen of the elevator, e, with the strap work, h h', for the purpose specified.

2d, The combination and arrangement of the grates, o p, and the sifter, q, for the purpose specified.

3d, The construction and arrangement of the levers, k k1 k2 k3, regulating the shutting or opening of the funnels, i i, for the purpose as stated and described.

71,329.—ROCK-DRILLING MACHINE.—Stillman W. Robinson and De Volson Wood, Ann Arbor, Mich.

We claim in rock drilling machines in which the drill has a rotary or feed movement, or both, the construction and arrangement of the cylinder so that its prolonged end may serve as a holder for the drill rod, or for driving the tool, and at the same time constitute one of the cylinder heads to receive the direct action of the motor, which thus produces the operation of drilling rock, etc., in the manner and for the purpose herein described.

Also the click, L, in combination with the ratchet, C (the latter forming the cylinder head), in the manner and for the purposes herein described.

71,330.—MACHINE FOR TEMPERING SAW PLATES.—A. J. Rockafellow, St. Louis, Mo.

I claim, 1st, The construction and arrangement of the carriage, B, and its cap, B', substantially as herein described and set forth.

2d, The setting guides, C, and in combination with these the set screws, c1, for the purpose of adjusting the distance between the cap and carriage to any required thickness of plates.

3d, The cap, B, in combination with the rocking bar, d, and also with the rope and weight, E and E', substantially as described and set forth.

4th, The carriage, B, when combined with the links, a, and the cord or chain, b, and raising shaft, b4, or equivalent devices, whereby the carriage may be moved down into and up out of the bath tub in a diagonal direction, and still retain its horizontal position, substantially as described and set forth.

71,331.—MANUFACTURE OF SHOES.—Ichabod R. Rogers (assignor to himself, John Woolredge, and Geo. E. Bartlett), Lynn, Mass.

I claim connecting the upper leather at the toe and heel by means of a cord, a, to which the edges of the upper are secured by stitches, d, as herein described.

Also, in combination with the above, the sliding guide or traveller, C, with its eye, S, for supporting the cord, a, in a central position, close to the bottom of the last, while the stitches, d, are being formed, substantially as set forth.

71,332.—LUBRICATOR FOR JOURNALS.—Morris Sellers, Keokuk, Iowa.

I claim the conical plug, D, in combination with the screw closing cap, E, substantially as described, and for the purposes specified.

71,333.—LAMP SHADE.—William F. Shaw, Boston, Mass.

I claim, 1st, The corrugated adjustable holder, B, as and for the purposes specified.

2d, The improved dome shade, when manufactured of the material and in the manner herein set forth and for the specified purposes.

71,334.—HORSE HAY FORK.—Joseph Shearer, Reading, Pa.

I claim the swivel, C, in combination with the lever, A, and operated by the arm, D, substantially as described.

71,335.—WATER WHEEL.—Henry W. Shipley, Portland, Oregon.

I claim, 1st, The combination of the parts, D E E', when constructed and arranged in relation to each other as shown and described.

2d, In combination with the foregoing, the arms or buckets, B, constructed and arranged as described.

3d, The gates, H, hinged at the outer extremities of the guides, F, and adapted to close inwardly, and provided with arms, i i, in combination with the links, f, and ring, G, when constructed and arranged in the manner and the purpose specified.

4th, In combination with the inwardly-closing gates, H, and guides, F F, the water passages between the latter, when constructed so as to diminish in hight from their outer to their inner ends, substantially as and for the purpose specified.

71,336.—PLATE LIFTER.—James M. Smith, Center Sandwich, N. H.

I claim my improved plate lifter, as made of wire, and with three jaws, B C C', and two handles, A A', bent or formed from such wire, and arranged with respect to each other substantially as above described, and as represented in the accompanying drawings.

71,337.—STEAM-ENGINE PISTON VALVES.—Isaac Soule, Albany, N. Y.

I claim, 1st, The bushings, f f, constructed substantially as and for the purpose specified.

2d, The steam passages, arranged as described, with reference to the followers, e e, and bushings, i i, for the purpose herein set forth.

71,338.—COTTON-BALE TIE.—James R. Speer, Pittsburg, Pa.

I claim, 1st, A clasp for baling cotton, said clasp being provided with contracted apertures of the form herein described, and bent in the manner and for the purpose set forth.

2d, In combination with the above, I claim bands made of semi-oval iron and in detached sections, as herein described and for the purpose set forth.

71,339.—REAMING TOOL.—C. F. Sylvester and John Brooks, North Bridgewater, Mass.

We claim the expansive reamer, as composed of the slotted tool carrier, A, the series of cutters, a, the stationary cone, E, the adjustable cone, B, the screws, b and c, and the clamp nuts, C and G, and the shank, F, arranged, combined, and constructed in manner and so as to operate substantially as explained and represented.

71,340.—FENCE.—Asahel Todd, Jr., Pultneyvill, N. Y.

I claim, 1st, The bracket, C, in combination with the posts, A, and strands, C' C', constructed and arranged substantially as specified.

2d, The brace wire, G, in combination with the posts, A, brackets, C, wires, C' C', and pickets, I, arranged in relation to these parts as specified.

71,341.—ADJUSTING CUTTER HEADS TO PLANING MACHINES.—Chas. R. Tompkins, Rochester, N. Y.

I claim the application to rotary cutter heads of the revolving sleeve, c, with its screw, the shouldered shaft, b, and the nut, d, in connection with the pin and slot, g, or set screw, e, for the purpose herein set forth, and substantially as described.

71,342.—PARALLEL MOVEMENT.—Andrew J. Vandegrift, Cincinnati, Ohio.

I claim, 1st, The system of levers described, when arranged and operated substantially in the manner and for the purpose set forth.

2d, The tension rods described, or their equivalents, when arranged and operated in connection with the levers described, substantially in the manner and for the purpose set forth.

3d, The system of levers and tension-rods, combined with and attached to stocks or planes, A and B, or their equivalents, by the means, in the manner and for the purpose substantially as set forth and described.

71,343.—HORSE HAY FORK.—Peter Vanderbelt, Jr., Hughesville, Pa.

I claim the combination of slotted stem, A, arms, B, and elbow pieces, C, when constructed, arranged, and operating in the manner as shown and described and for the purpose set forth.

71,344.—FISHING REEL.—Julius Von Hofe, Brooklyn, E. D., N. Y.

I claim the bridge, j, in combination with the disk, b, shaft, f, cap, C, substantially as and for the purpose described.

71,345.—STOVE GRATE.—C. Waters and H. A. Brown, Poughkeepsie, assignors to Henry C. Giles, Troy, N. Y.

We claim, 1st, A front rest for a stove grate, having one portion arranged to open, in the manner and for the purposes set forth.

2d, The rest, in parts Nos. 1, 2, and 3, or their equivalents, in combination with the swivel joint.

3d, The rest, A, comprised of the parts, Nos. 1, 2, and 3, in combination with the cross bar, E, when the axis or end bearings are back of or one side of the center grate, B.

71,346.—INSECT TRAP.—Wm. Weaver, Phoenixville, Pa.

I claim the box, A, when provided with tubes, g g g, arranged and constructed as set forth.

71,347.—BASE-BURNING STOVE.—Charles M. Whelden, Pittsfield, Mass.

I claim, 1st, The air-passages, G, for conducting atmospheric air and discharging the same into the fire chamber of a stove or furnace at or near the surface of the fire, substantially as described.

2d, Also, the air-passages, G, in combination with the reservoir, D, substantially as set forth.

3d, Also, the gas pipe, I, (one or more,) or its equivalent, in combination with the reservoir, D, substantially as set forth.

4th, Also, discharging gases which collect in the reservoir, D, into the fire chamber at or near the surface of the fire by means of a pipe, I, or its equivalent, substantially as set forth.

5th, Also, conducting heated air from the air passage, G, and discharging it into the space or chamber below the grate by means of a pipe, J, or its equivalent, substantially as described.

71,348.—HOT-AIR FURNACE.—T. Whitaker, Bolton, and J. Constantine, Manchester, Eng.

We claim, 1st, Constructing stoves of hollow segments, open towards the inner side, forming, with the lining slabs, flues presenting a large absorbing surface for the heat, and a large outer surface for heating the air or liquids, and possessing great elasticity, substantially as described.

2d, Forming joints of stoves by ramming clay or other substances between ribs at the inner edges of the segments and metal plates retained by outer ribs cast on the sides of the segments, substantially as described.

71,349.—BREECH-LOADING FIRE-ARM.—Eli Whitney, New Haven, Conn.

I claim, 1st, The construction of the slotted and grooved tenon, B', on a double-barrel breech loading shot gun, substantially in the manner and for the purpose described.

2d, The manner, substantially as herein described and shown, of constructing, arranging, and combining the stock, the lock, the barrels, the levers, and the slotted grooved tenon, B', for the purpose set forth.

3d, Pivoting the spring-extractors, G, which are constructed and arranged as described, at their rear ends, as and for the purpose set forth.

4th, The construction of the breech closers, b, and the hollow metallic lock frame, in the manner and for the purpose described, in combination with the reduced breech end of the sliding barrels, as described.

5th, The open slots, k k, in combination with the open slotts, j j, substantially in the manner and for the purpose described.

6th, The slotted and grooved tenon, B', attached firmly between the two barrels, B B, and connected to a forked frame, A A, and to two levers, C C', all substantially in the manner and for the purpose described.

71,350.—KEY GUARD FOR DOOR LOCKS.—John Wiard (assignor to himself and Thomas A. Conklin), New Britain, Conn.

I claim in the manufacture of locks, the employment of the spring, e, depression, E, in combination with the bolt, c, tumbler, d, substantially as and for the purpose described.

71,351.—MACHINE FOR MAKING METAL BOXES.—Jacob Wild (assignor to J. S. Mason & Co.,) Philadelphia, Pa.

I claim, 1st, The forming disks, S and T, arranged parallel to each other, caused to revolve in contrary directions, and to move from and towards each other by the aid of the mechanism herein described, or any equivalent to the same, for the purpose specified.

2d, The plate, R, on which the unformed box is deposited, in combination with the said forming disks and the appliances herein described, or their equivalents, for imparting an intermittent vertical reciprocating movement to the disks.

3d, The elastic arm, o, in combination with the cam, d', and the mechanism herein described, or its equivalent, for transmitting the motion of the said arm to the shaft, H, and its forming disk, T.

71,352.—BED BOTTOM.—Lewis Wilson (assignor to himself and Andrew Dunlap), Ovid, N. Y.

I claim, 1st, A spring bed bottom, the slats of which are suspended from rollers, B B, by means of strips of cloth, in combination with springs, g g, and the connecting straps, d d, arranged substantially as described.

2d, Securing the slats composing the bed bottom to strips of cloth, c c, attached by hooks, or their equivalents, to strips, a a, which are wound upon rollers, substantially as described.

71,353.—MANURE FORK.—Peter Yeugst, Union Deposit, Pa.

I claim the improved manure fork constructed and arranged with the handles, C C, adjustable by the blocks, d d, down and up on the standard, B, and with the middle prong, G, shorter than the outer prongs, E E, substantially as and for the purpose herein specified.

71,354.—LAMP.—Henry Young, Cincinnati, Ohio.

I claim, 1st, The provision in a lamp burner of an air duct, F, so arranged as to admit a movement to or from the wick, substantially as stated.

2d, The arrangement of the air ducts or tubes, E F, and wings, I I, all constructed and applied in the manner described, and for the purpose set forth.

71,355.—REDUCING MANGANESE ORES.—C. Adams (assignor to himself and Henry R. Hains), Philadelphia, Pa.

I claim the reduction of the ores of manganese by carbureted hydrogen gas under pressure, in the manner described.

71,356.—LUBRICATING COMPOUND.—F. T. Allyn (assignor to himself and J. A. Rich), New York city.

I claim a lubricating compound, consisting of the ingredients in about the proportions set forth.

71,357.—ELASTIC ROCKERS FOR CHAIRS.—John Barron, Cincinnati, Ohio.

I claim the employment of elastic tubes or pipes in combination with chair and other rockers, substantially as and for the purpose here specified.

71,358.—ASH SIFTER.—G. W. Bishop (assignor to D. S. Trowbridge), Stamford, Conn.

I claim the combination of the sliding grate, C, inclined grates, D D, or their equivalents, lever, F, ash-box, B, and cinder box A, and cover, E, constructed and arranged substantially as herein specified.

71,359.—MUSICAL TABLET.—John Branique, New York city.

I claim the musical tablet provided with the movable note pegs, substantially as and for the purposes set forth.

71,360.—DIES FOR THREADING SCREWS.—George B. Brayton, Providence, R. I., assignor to himself, Solomon W. Young, J. W. Hoard, and Lyman A Cook.

I claim, 1st, A rotary die for cutting screws, in which the cutting surface is at varying distances from the axis or center of motion of the said die, so as to conform to the taper and varying dimensions of the screw blank to be cut, substantially as herein shown and set forth.

2d, A rotary cam die, in which the concave cutting surface is made tapering or of varying dimensions, so as to fit both the shank and taper end of the blank to be cut, as herein specified.

3d, The method herein described of cutting the screw-thread upon both the shank and taper end of a blank, by the employment of two or more rotary cam dies, constructed and arranged as specified, so that, while their centers of motion are fixed and unchanged, their cutting surfaces shall approach or recede from each other, to conform to the varying dimensions of the blank passing between them.

4th, In a rotary cam die, as herein described, I claim the combination with the tapering cutting surface of the cleaning space, k, substantially in the manner and for the purposes herein shown and specified.

71,361.—DENTAL DRILL.—H. F. Bryant, Marathon, N. Y.

I claim the construction and arrangement of the slotted tube, A, having side box, c, piston, a, with the rack, c, operating the pinion, d, sliding ring, f, and hollow handle, h, containing the spiral spring, as set forth, for the purpose specified.

71,362.—FILE CUTTER.—Geo. F. Card and Chas. A. Studley, Bridgeport, Conn.

We claim, 1st, The combination of the ball and socket joint, j and i, with the universal motion apparatus, u and v, when they are constructed, combined, and fitted to feed and to adjust the blank, substantially as herein described and set forth.

2d, The combination of the hammer, N, chisel, f, and spring, P, when they are constructed, connected, and fitted to produce the result, substantially as herein described and set forth.

3d, The combination of the worm, K, and wheel, G, and, r r, with the pinion, s, screw, H, and segmental nut, y, when they are constructed, combined, and fitted to feed the blank, substantially as herein described and set forth.

4th, The combination of the turn table with the feeding and blank-holding apparatus herein described, when constructed and fitted to govern the cut, substantially as herein set forth.

5th, The combination of the turn table and holding device with the anvil, j, and ball, p, and its appendages, when they are constructed, combined, and fitted for use, substantially as herein described and set forth.

71,363.—CASTER FOR FURNITURE.—L. Frederick Cerf, New York city.

I claim the fixed supporting leg, H, upon one side of the sleeve, B, and between the caster arms, C C, as herein described, for the purpose specified.

71,364.—ANIMAL TRAP.—J. W. Churchill, Pittston, Pa.

I claim, 1st, The pivoted passage, H, arranged in relation with the two boxes, A B, the door, C, and the two holes, d e, in box, A, substantially in the manner as and for the purpose set forth.

2d, The hinged platform, E, counterpoised as shown, and provided with the rod, i, in combination with the pendent rod, I attached to the passage, H, and the bent lever, D, to which the door, C, is attached, all being arranged to operate in the manner substantially as and for the purpose specified.

3d, The platforms, b c, in combination with the two holes, d e, and the passage, H, substantially as and for the purpose set forth.

71,365.—SASH-CORD FASTENER.—J. Correja, Brooklyn, N. Y.

I claim the sash cord fastener formed of the socket, c, for enclosing the knot, combined with the tubular cord-holder, e, upon one side, and adapted to being applied to the sash, in the manner specified.

71,366.—HAY RAKER AND LOADER.—Ezra N. Curtice, Spring Water, N. Y.

I claim, 1st, The spout or hopper, E, and rollers, D D', operated in manner and for the purposes substantially as above set forth and described.

2d, The curved slot, F, spring, f, and sliding bar, G, in combination with the rollers, D D', in manner and for the purposes substantially as above set forth and described.

3d, The sliding bar, G, metal scraper plate, I, in combination with the spout or hopper, E, in manner substantially as above set forth and described.

4th, The spout or hopper, E, having the axle, a, of the carrying-wheels, A, journalled in the ears, e, in manner substantially as above set forth and described.

5th, The rods, K K and L L, in combination with the bed pieces of the rack, I', or any equivalent method of attaching the elevator to the wagon, in manner and for the purposes substantially as herein set forth and described.

71,367.—COVERING FOR PLASTERED WALLS.—Abbot R. Davis, Cambridge, Mass.

I claim the within-described covering for plastered walls, consisting of sheets of wood as a substitute for ordinary house paper, or paper hangings, substantially as set forth.

Also, saturating the sheets of wood previous to applying them to plastered walls, substantially as and for the purpose set forth.

71,368.—STOVE DAMPER.—E. T. Duke, Plattsmouth, Nebraska.

I claim the triangular guards, E, constructed as described, attached at e e' to the rings, B, as herein set forth, for the purpose specified.

71,369.—BELT SHIFTER FOR ROVING MACHINE.—Jabez Edwards, Lowell, Mass.

I claim, 1st, The plate, m, and belt guide plate, j, with inclined slots, or their equivalents, substantially as and for the purpose set forth.

2d, The rod, q, and stud-slide, t, with stud, u, for the purpose substantially as herein described.

3d, The combination and arrangement of the plates, m and j, with inclined slots, k and l, or their equivalents, rod, q, and stud slide, t, with stud, u, when operating substantially for the purpose described and set forth.

71,370.—DIVIDER.—Edwin S. Fisher, Boston, Mass.

I claim the dividers, constructed as described, consisting of the leg, A, having the ark-shaped arm, C, and the small hinged leg, D, when the leg, A, is adapted to form a punch to be struck by a hammer, as herein shown and described.

71,371.—BOBBIN.—Charles H. Fiske Lowell, Mass.

I claim a filling bobbin, whose sides, for a greater or less portion of its length, are formed to resemble a succession of inverted truncated cones, substantially as described, for the purpose specified.

71,372.—POST-DRIVER.—C. T. Fitch, Harbor Creek, Pa.

I claim the posts, B, hinged by the joints, a, to the runners, A, when adjusted in any required position, by means of the staples and pins, d, passing through the slotted lower end of the hinged brace, C, as herein described for the purpose specified.

71,373.—PERMUTATION LOCK.—Chas. Flesch, Rochester, N. Y.

I claim, 1st, The combination of the weight, H, with the fly, m, of the lever, G, and the wheels, C C C, operating in the manner and for the purpose substantially as herein set forth.

2d, The combination of the cam hook, n, and eccentric surface, o, with the fly, l, of lever, G, operating substantially in the manner and for the purpose set forth.

3d, The combination and arrangement of the conical or tapering screw pin, u, with the flattened side of the spindle, B, operating in the manner and for the purpose set forth.

4th, The employment of the intermatching teeth, e e', in combination with the clamping plates, w w', and screw, y, arranged and operating as specified.

71,374.—TOY FORTUNE-TELLER.—Charles T. Ford, Salem, Mass.

I claim, 1st, Placing the prophetic sentences upon the periphery or face of a revolving wheel, substantially as and for the purpose specified.

2d, Employing spring mechanism to bear down the arms of the figure of a fortune-telling toy, substantially as shown, and for the objects specified.

3d, The treadle, T, or other equivalent device, for lifting the brake, m, from the wheel, substantially as and for the purpose shown and described.

4th, The scrolls or cards, K, with questions and answers thereon, lettered and numbered, substantially as shown and described, in combination with the numbers on the wheel, B, as and for the purpose set forth.

5th, The holes, L, in the base, A, in combination with the wheel, B, of a fortune telling toy, substantially as and for the purpose shown and described.

6th, The rubber brake, m, substantially as and for the purpose of stopping a toy wheel, all as set forth.

71,375.—GAS METER.—David Forrest (assignor to himself, P. M. Keene, and D. N. Clark), Eastport, Me.

I claim, 1st, The central tube, B, and the gas wheel, A, constructed and arranged substantially as shown and described.

2d, The elastic disk, g, and the spring, h, on the periphery of the gas wheel, and in combination therewith the catch, J, substantially as and for the purposes set forth.

3d, Revolving the gas wheel, A, and registering or recording the amount of gas consumed, by the action of a spring operating suitable gearing for that purpose, substantially as herein shown and described.

71,376.—PLOW.—Charles Forster, Lebanon, Pa.

I claim, 1st, Forming recesses, e1 e2, in the standard, C, or forward end of the mold board, D, to receive the flange, e1, and tongue, e2, formed upon the forward end of the land side, E, substantially as herein shown and described, and for the purpose set forth.

2d, Forming a recess or groove, e3, in the outer side of the flange, e1, of the land side, E, for the reception of the projection, f' formed upon the inner side of the rear part of the cutter, F, substantially as herein shown and described, and for the purpose set forth.

71,377.—PRESERVING ANIMAL AND VEGETABLE SUBSTANCES.—John Gamgee, Bayswater, England. Arthur Gamgee, Edinburgh, Scotland.

We claim, 1st, The use of carbonic oxide in the process of preserving animals whose flesh is to be used as human food, whether by causing animals to inhale carbonic oxide gas as they die, or by placing the meat in chambers or vessels containing carbonic oxide alone, or in conjunction with other gases or vapors.

2d, The use of charcoal saturated with sulphurous acid or other antiseptics, in conjunction with carbonic oxide and other gases or vapors, for the preservation of animal substances.

71,378.—FUNNEL.—James Gondouin (assignor to himself and Felix Aumerie) New York city.

I claim the funnel, a, and valve, d, in combination with a float, g, latch, l, and block, n, substantially as and for the purposes set forth.

71,379.—CORN PLANTER.—James M. Gordon and E. Christianson, St. Joseph, Mo.

We claim, 1st, The combination of the lever, K, gear-wheel, J, sleeve, H, and clutch and band pulley, G, with the cross bar, F, and axle, E, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the band, M, pulley, N, shaft, O, and wheels, T, with each other, and with the pulley, G, and seed-boxes, P, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the markers, W, with the shaft, O, and wheels, T, substantially as herein shown and described, and for the purpose set forth.

71,380.—CEMENT STOVE PIPE THIMBLE.—Henry Goss, Union Mills, Pa.

I claim a composition or cement stove pipe thimble, A, cast in a permanent mold or frame, B, as a new article of manufacture, substantially as described.

71,381.—BEEHIVE.—Arthur Gray, Reiley, Ohio.

I claim, 1st, The case, C, when placed within the case, A, and resting upon the inclined bottom, B, to form the chamber, c, surrounding said case, C, through which chamber the air passes from the openings, d, in the bottom, B, to the openings, e, in the top, a, affording constant ventilation, as herein shown and described.

2d, The adjustable slides, F, fitted in the guide, g, constructed as described, having notches, h, upon their lower sides, and the long notch, i, upon their upper sides, registering with the notches, f, in the hive, as herein described for the purpose specified.

71,382.—BUTTON-FASTENER.—Robert B. Griffin, Jr., Baltimore, Md.

I claim my improved button-fastening device, formed of a coiled ring, arranged to pass through the cloth and the eye of the button, and combined with a retaining base, substantially in the manner and for the purpose herein set forth.

71,383.—KILNS FOR CHARRING WOOD, ETC.—William H. Guignon, and William D. McDonald, Warren, Pa.

We claim, 1st, A kiln, for charring or carbonizing wood or coal, which is self-acting or automatic in its operation, substantially as described.

2d, A portable kiln, for carbonizing wood or coal, which is formed of a double wall, or an outer and an inner shell, whereby the heat is confined in the kiln, substantially as shown and described.

71,384.—ROTARY STEAM ENGINE.—A. S. Harlan, Bloomington, Ill.

I claim, 1st, The arrangement of the flaps, E E, so as to slide in grooves from one side of the induction ports to the other, in order to reverse the engine, substantially as described.

2d, The arrangement of the eduction ports, S, of the cylinder, so as to release the steam after a semi-revolution of the piston, substantially as herein set forth.

71,385.—RAILROAD CAR VENTILATOR.—Charles H. Haskins, St. Louis, Mo.

I claim, 1st, The use of an eaves trough, or its equivalent, to hold the water when raised, allowing it to fall in sheets or drops in quantity as required, and for the purposes set forth.

2d, The combination of the wind mill, the worm or screw pipe, and the eaves trough, or their equivalents, substantially as described, for the purpose herein set forth.

71,386.—ROOFING.—R. P. Henry, Akron, Ohio.

I claim the vertical strips or breakwaters, D, fitted in grooves in the boards or planks, B, and projecting above the upper surfaces of the same, in connection with the battens, E, substantially as and for the purpose set forth.

I further claim the combination of the battens, E, strips, C, and breakwaters, D, all arranged and applied to the boards or planks, B, substantially as and for the purpose specified.

71,387.—CLAMP FOR PLANKING SHIPS' SIDES OR FLOORS.—John J. Hill, Sodus Point, N. Y.

I claim the serrated segmental swinging arms, C c, when attached to bar, A, and constructed to operate with screw, B, in the manner substantially as described.

71,388.—STOVE COVER LIFTER.—George W. Hunt, Winchendon, Mass., assignor to Washington Whitney and I. J. Dunn.

I claim, as a new article of manufacture, the lifter, when constructed substantially as described.

71,389.—WINDING WATCH.—Charles E. Jacot, Chaux-De-Fonds, Switzerland.

I claim, 1st, The wheel; 10, connected with the wheel, m, and fitted so as to be moved into gear with the wheel, x, in the manner and for the purposes set forth.

2d, The pin on the wheel, f, taking loosely into an opening in the flange or disk of the arbor of the minute hand, for the purposes and as set forth.

3d, The lever, y, and spring, 12, applied as set forth, in combination with the stud, 11, and swinging-gear carrier plate, k, substantially as and for the purposes set forth.

4th, The pawl, 15, made in one piece of metal with its curved spring, in combination with the plate, c, against the edge of which said curved spring lies, as and for the purposes set forth.

71,390.—MANUFACTURE OF PAPER VESSELS.—Augustus Jennings, and Isaac Jennings, Fairfield, Conn.

We claim forming and drying the paper to form the vessel or other article over hollow metallic formers of the desired shape, heated by steam or hot air introduced into their interior, substantially as herein shown and described.

71,391.—CAR BRAKE.—Thomas A. Kelley (assignor to himself and William G. Wilson), Cleveland, Ohio.

I claim, 1st, The brake-setting mechanism, consisting of the cam, b', with its V-shaped shoulder, the eccentric, b, with its V-shaped projection both upon the axle of the car, the lever, c, connecting bar, h, slide, h', with its notch, dog, k', with its tooth, chain, r,' and spring, A, in combination, substantially as described.

2d, The letting-off mechanism, consisting of the lever, l, with its bail, m, dog, k', with its tooth, the slide, h', with its notch, the chain, r', and the tempered spring, A, substantially as described.

71,392.—RAILWAY CAR BRAKE.—Johnson Kitchen, William Kitchen, and Samuel Samuels, Accrington, England.

We claim the screw shaft, G, with its nut, e, arranged and operating on a car or truck, in combination with the shaft, H, its arm, I, connected to the nut, e, and its arms, a a, connected to the brakes of the car, as set forth.

71,393.—HOISTING APPARATUS.—William H. Kuntz, Mount Rock, Pa.

I claim the slide, as constructed, combined and operated with the rope, as herein described, and for the purpose set forth.

71,394.—VELOCIMETER.—Edward A. Lewis, St. Charles, Mo.

I claim the use of one or more eccentrics, with intermittent rotation, regulated by connecting clock work and other appropriate mechanical devices, as gear wheels, springs, etc., for indicating, at repeated intervals of time, the rate of speed of running machinery in such intervals, while such machinery continues in motion.

In combination with a velocimeter thus constructed, I claim a lock, which may indicate the time of day in connection therewith, substantially as set forth.

71,395.—FLOUR BOLT.—Spencer Lewis, Tiffin, Ohio.

I claim, 1st, A bolting cloth, applied to a sliding frame, and arranged within a bolting reel, which is covered with bolting cloth of different degrees of fineness, for producing different grades of flour at pleasure, substantially as described.

2d, The hammers, g secured to crank shafts, the cranked ends of which play in slotted arms, h', upon longitudinally sliding spring rods, J, in combination with an adjustable cam plate, S, upon the inside of the bolting chest, all constructed, arranged, and operating substantially as described.

3d, The adjustable screw pulley, r, applied upon a stud, p, and provided with cord, N, for adjusting the cam plate, S, substantially as described.

71,396.—LAMP CHIMNEY CLEANER.—John H. Lightner, Shirleysburg, Pa.

I claim an implement for cleaning lamp chimneys, formed of spring bands, A, fixed at each end to a center stem, B, in combination with the slide or collar, E, substantially as and for the purpose described.

71,397.—NURSERY CHAIR.—Mrs. Caroline M. Loring, and Ezekiel Averill, Charlestown, Mass.

We claim the combination of the stool, a, and chair, having the several parts arranged substantially in the manner as described and shown.

71,398.—PAPER BAG.—David Manuel, and Calvin F. Manuel, Boston, Mass.

We claim the triangular paper bag, constructed as described, by folding the sides, d e, one upon the other, of the parallelogram, cut with the apex, a, as shown in fig. 1, in the lines, f e, and f b, upon the triangular center described by the lines, a b a c, and b c, and by folding the apex, a, over the said folded sides, e d, as herein set forth, for the purpose specified.

71,399.—HEATER.—J. A. Marvin, Red Wing, Minn.

I claim, 1st, The evaporating vessel, E, suspended in the central opening, F, of the drum, C, by means of a rod from the top of the drum, said rod bearing the register, as herein described, for the purpose specified.

2d, The arrangement of the annular drum, C, supported within the radiator, D, by the pipes, g, said radiator resting upon the stove, A, driving-flue, J, pipe, H, tube, m, evaporating vessel, E, register, O, and hot air pipes, n, as herein shown and described.

71,400.—STEAM GAS GENERATOR.—Hiram S. Maxim, New York city.

I claim, 1st, An apparatus for generating gas by steam from gasoline, naph-

tha, benzine, or other hydrocarbon oils, where the flow of the steam into the generator is governed and controlled by the pressure of the gas so generated.

3d, In combination with a steam gas generating apparatus, the screen, J', substantially as and for the purposes described.

3d, In combination with a steam gas generating apparatus, the superheating tube, C, and the interior supplementary tube, f, substantially as and for the purposes herein shown and specified.

71,401.—Machine for Planig and Slotting.—Charles A. Meinhard, Fort Wayne, Ind.

I claim, 1st, The combination of worm wheel, D, with the sliding adjustable plate, C, and up-and-down adjustable plate, G, all made, arranged, and operating substantially as and for the purpose herein shown and described.

2d, The cutter, L, when hinged in the slotted stem, K, and connected with the spring, m, substantially as and for the purpose herein shown and described.

3d, The adjustable plates, J or J', when provided with shanks, H, respectively, for holding the tool, and when combined with the up-and-down adjustable plate, G, of a planing machine, substantially as set forth.

4th, The shafts, B and E, worm, F, plate, C, disk, D, and plate, G, in combination with the plate, J or J', stem, K, and cutter, L, all made and operating as and for the purpose herein shown and described.

71,402.—Bung Extractor.—Felix Miller and Hypolite Perrot, New York city.

We claim the lever, A, with a circular cavity, a, at its end, in combination with the strap or bow-shaped lever, B, hinged to said lever, A, the whole being constructed and operating in the manner and for the purpose substantially as set forth.

71,403.—Improvement in Planing Machine.—Edward Myers (assignor to Lane & Bodley), Cincinnati, Ohio.

I claim the method herein described of attaching the matcher head, C, to its mandrel by means of the screw rod, D, passing centrally through the matcher head, and screwed into the collar, B, one of whose ends is provided with the pin, E, fitting into the inner part of the said matcher head, substantially as set forth.

71,404.—Carriage Shaft and Pole Coupling.—Earl C. Newton, Batavia, Ill.

I claim, 1st, The application of the lever, B, to the shaft iron, D, through the hole, C, and F, as herein described.

2d, The application of the spring, G, to the slide iron or lever, B, in the manner and for the purpose set forth.

71,405.—Beehive.—Lucius M. Olden, Pana, Ill.

I claim the baked earthenware or stoneware beehive, furnished with comb frames, and constructed substantially in the manner herein described and shown, as an improved article of manufacture.

71,406.—Wagon.—Henry Parker, Leesburg, Miss.

I claim the round revolving axle, with its attachings all combined, substantially as and for the purpose described.

71,407.—Medical Compound.—Samuel Payne, Louisville, Ky.

I claim a medical compound, formed of the ingredients substantially as and for the purpose described.

71,408.—Cast Iron Car Wheel.—George Peacock, Selma, Ala.

I claim, 1st, The combination of the curved plate, c, with the gradually diminishing arms or spokes, a a, substantially in the manner and for the purpose specified.

2d, The cast iron wheel above described, having the deep arms, a a, with openings between them around the hub, the curved plate, c, attached to the arms, a a, as shown, and united to the inner edge of the rim or tread, and the supporting brackets, a' a', all combined and arranged substantially as and for the purposes set forth.

71,409.—Jack Center for Spinning Machine.—Francis R. Pearson, Germantown, Pa.

I claim, 1st, The combination of worm wheel, p, and dog, z, as described, for the purpose set forth.

2d, The combination of worm wheel, p, dog, z, catch, r, and oscillating stand, m, as described, for the purpose set forth.

3d, The combination of the wheel, p, catch, s, lever, O, and shifter bar, t, or an equivalent arrangement of the same, as described, for the purpose set forth.

71,410.—Safe Door Bolt.—John K. Pierson, Newark, N. J.

I claim arranging the bolts in safes having double doors so that they extend across the door and can be locked at once into the opposite door and into the casing two or more bolts being provided in each door and operated at once from the lock, substantially as and for the purpose herein shown and described.

71,411.—Door Lock.—E. P. Porter and G. W. Hallett, Waterford, N. Y.

We claim the combination with the catches, H, of the levers or "lift-ups" P2, or their respective equivalents, when combined together substantially as and for the purpose described.

Also the slides, A2, either one or more, substantially as and for the purpose specified.

71,412.—Elastic Rein Pull.—J. G. Pugsley, N. Y. city.

I claim an elastic rein pull adapted to being grasped by the hand and interposed between the hands and the reins, as and for the purposes set forth.

71,413.—Mechanism for Threading Shuttles.—Lewis Ripley, North Chelmsford, Mass.

I claim the combination of the cylinder, A, piston, B, tubular rod, C, spiral spring, D, and elastic mouth-piece, a, constructed and arranged to operate as herein shown and described.

71,414.—Uterine Supporter.—A. C. Rohleder, N. Y. city.

I claim a support for the *os uteri* composed of the spring, a, and flexible membrane, B, either with or without the central perforation, substantially as described for the purpose specified.

71,415.—Draft Attachment for Horses.—Elias Sanford, Meriden, Conn.

I claim, 1st, The whiffletrees, D, connected by a swivel joint to the curved bar, A, when such whiffletrees are removably pivoted to the side of the hames, c, as herein described for the purpose specified.

2d, In combination with the curved bar, A, whiffletrees, D, and hames, c, the tongue, B, when provided with the elastic block, b, substantially as described for the purpose specified.

71,416.—Carpenters' Hatchet.—John T. Shank (assignor to himself and Jonathan Strine), Martinsburg, Va.

I claim the construction of the arched nail drawer, C, with its slot, E, at the top of the hatchet, B, as herein described and for the purposes set forth.

71,417.—Railroad Rail.—George V. Sheffield and Byron Whitcomb, Worcester, Mass.

We claim, 1st, A reversible double rail for railways, made substantially as herein shown and set forth and for the purposes specified.

2d, The combination with the ends of two rails, as described, of the central splice or connecting piece, E, substantially as and for the purposes set forth.

71,418.—Telegraph Insulator.—W. Edgar Simonds, Hartford, Conn.

I claim the insulator, B, having the inverted lip, c, in combination with the cup, d, the india-rubber hood, g, and the supporting peg, A, constructed and arranged substantially as described.

71,419.—Plow.—Samuel S. Starnes, Macomb, Ill.

I claim, 1st, The combination of the standard, b, spring, d, rod, l, and beam, a, substantially as and for the purpose described.

2d, The combination of the lever, h, rack bar, k, and plow beam, a, substantially as and for the purpose described.

71,420.—Cracker-making Machine.—David Stewart, Philadelphia, Pa.

I claim, 1, The mechanical combination of fluted rollers, C and C', roller R R' R'' and R''', double set of endless leathern or other suitable material bands, S B S B and S' B' S' B', running symmetrically in opposite directions, for the purpose and in the manner above set forth and described.

2d, The combination of fluted rollers, C F, with concave box, C B, drawn from different centers, for the purpose and in the manner above set forth and described.

3d, The combination of rollers, C and C' R R' R'' R''', endless band, S B and S' B', roller, C F, and concave box, C B, all constructed and operated in the manner and for the purpose above set forth and described.

4th, Sliding top frame (wooden or otherwise), S T, and knife, K, combined, constructed and operated in the manner and for the purpose above set forth.

5th, The combination of rod and claw stoppers, 33, with weight rod, 34, weight, 35, constructed and operated in the manner and for the purpose above set forth and described.

6th, The rest or horizontal strip, 41, with elbow, 40, constructed and operated in the manner and for the purpose above set forth and described.

7th, Spring lever, L V, eccentric weight log, 42, combined with rest, 41, and elbow, 40, constructed and operated in the manner and for the purpose above set forth and described.

8th, The combination of frame, M F, disk, C A, and forks, f f f, with slides, I T and I T', constructed and operated in the manner and for the purpose above set forth and described.

9th, The application to elbow of rod, r d r d, of weights, W W W, for the purpose above set forth and described.

10th, Cushion block, B L, combined, with the fork arrangement, and constructed and operating in the manner and for the purpose above set forth and described.

11th, The combination of bar, B A R, with eccentric, E X and E' X', and shaft, P A, constructed and operated in the manner and for the purpose above set forth and described.

12th, Bar, B' A' R', combined with its eccentrics, E'' X'' and E''' X''', and shaft, P' A', constructed and operated in the manner and for the purpose above set forth and described.

13th, The combination of springs, S P, on uprights, V'', bar, B A R, and its square-keyed end, constructed and operated in the manner and for the purpose above set forth and described.

14th, Sieve box, B X, and flour sieve tin cup, T C, combined with spring and cam, C S P, constructed and operated in the manner and for the purpose above set forth and described.

15th, A cracker-making machine being the combination of all the different parts and pieces above separately claimed, constructed and operated in the manner and for the purpose above set forth and described.

71,421.—Cooking Stove.—Hamilton Stickney, Reno, Pa.

I claim, 1, The construction of the oven, C', formed by the circular slides, a, around the furnace, as herein described for the purpose specified.

2d, The stove, A, constructed as described and provided with the air openings, e', forming a communication from the oven, C', through said furnace to the annular flues, I, and bread oven, E, as herein described for the purpose specified.

3d, The flues, f f', and the air passages, J I I, and the revolving shelves, m m, in the elevated oven, E, arranged relatively to the fuel supply chamber, B, and operating substantially as shown and described.

71,422.—Axle Box for Cars.—William Stone, Hollidaysburg, Pa.

I claim the sliding lid, B, with the shoulder projection, c, on the under side and the hooked head, b, in combination with the lugs, a a, on the sides and the projection, c, on the top of the box, A, with its sloping side, d, arranged and operating substantially as herein described.

71,423.—Refrigerator Car.—J. B. Sutherland, Detroit, Mich.

I claim the double-walled, double-roofed, double-floored car having ice chests, A, at each extremity closed by the hanging flaps, B, substantially as above described having spaces, S and F, arranged so as to produce a constant circulation of the air in the car, in manner substantially as and for the purposes above set forth and described.

71,424.—Artificial Leg.—Charles Swett, Vicksburgh, Miss.

I claim, 1st, The flat vertical spring, c, combined with the horizontal rubber cushion, m, the leg, A, and foot, B, arranged and operating substantially as and for the purposes herein described.

2d, In combination with the above, I claim the elastic cushion, n, substantially as described for the purpose specified.

71,425.—Engines for the Use of Steam and Air Combined.—John Blake Tarr, Chicago, Ill.

I claim, 1, Reheating or superheating steam after it has left the generator by means of highly-heated air introduced into the steam chest under considerable pressure, substantially as described.

2d, Applying steam and air within the valve chests or cylinders of engines by introducing air into said cylinders when the air is heated to a temperature equal to or greater than that of the steam, substantially as and for the purpose described.

3d, The steam pipe, D, and hot-air pipe, D1, communicating with the valve chest of an engine and provided with suitable valves for alternately shutting off and letting on the steam and air, substantially as described.

71,426.—Liquid for Bleaching and Removing Stains.—Maria E. Tompkins, Brooklyn, N. Y.

I claim the improved bleaching fluid composed of the ingredients and in the proportions substantially as herein described.

71,427.—Key Board Attachment for Musical Instruments.—Eben Tourjée, Providence, R. I.

I claim the employment or use of springs, or their equivalents, applied to the key board of a musical instrument and arranged in connection with the keys thereof, to operate in the manner substantially as and for the purpose specified.

71,428.—Gas Cigar Lighter.—J. W. Tracy, St. Louis, Mo.

I claim the figure, a, attached by the flexible tube, c, to the gas pipe, b, in combination with the elastic cord, f, operating on the weighted lever, e, in the manner and for the purpose substantially as shown and described.

71,429.—Machine for Ornamenting Buttons.—John Tunnicliff and Patrick Cahill (assignors to A. P. Critchlow), Northampton, Mass.

We claim, 1st, The rotary mandrel, G, fitted in movable bearings, J J', and provided with squares, K K', in combination with the adjustable roller, f, connected with a sliding bar, L, on the head, C, all arranged to operate in connection with the cutter, F, substantially in the manner as and for the purpose set forth.

2d, The lever, M, provided with the adjustable roller arm, N, in combination with the bevelled notch, l, in the sliding bar, L, and the mandrel, G, fitted in movable bearings, J J', substantially as and for the purpose specified.

71,430.—Burner for Locomotive Head Lights.—Aaron C. Vaughan, Philadelphia, Pa.

I claim, 1st, The perforated casing, m, shield, M, and intervening space between the two.

2d, The openings, t, in the shield, M, for the purpose specified.

71,431.—Head Light for Locomotives.—Aaron C. Vaughan, Philadelphia, Pa.

I claim, 1st, The combination of the burner of a locomotive head light, a parabolic reflector and a lens situated within or adjacent to the front edge of the reflector, substantially as and for the purpose described.

2d, The reflecting flaring ring, J, arranged in front of and concentric with the lens, as set forth.

71,432.—Elevated Railway.—Sylvanus Warren and William M. Blume, New York city, assignors to themselves and A. V. Briesen.

We claim, in combination with a railway as above described, having the rails at the extremities of the arches, and the central guiding rail, the car truck, I, the central guide wheel and rods for supporting the car, as herein shown and described.

71,433.—Constructing Furnace Doors.—Joseph Watson (assignor to himself and Solomon Drullard, Jr.), Buffalo, N. Y.

I claim, 1st, Constructing furnace doors of a single brick, A, in combination with an iron frame, B, substantially in the manner and for the purpose set forth.

2d, Also the manner of constructing the frame, B, with the wrought-iron cross bars, g g, and lugs, h h, for sustaining the brick and securing them in the frame, substantially as specified.

3d, Also constructing the door arch of a single crown piece, C, formed with an inclined back, i, and recess in front for and in combination with the iron plate, D, substantially as and for the purpose set forth.

71,434.—Machine for Scaling Fish.—Napoleon Bonaparte White, Cecil county, assignor to himself and Frederick B. Hoffman, Baltimore, Md.

I claim a hollow cylinder provided with blades or points, or their equivalents, projecting inwardly from its circumference or sides, when made to revolve and otherwise adapted to the purpose of removing the scales from fish, substantially as herein set forth.

71,435.—Fruit Box.—Henry B. Wilcox, Troy Mills, Pa.

I claim securing the bottom of a fruit box to its sides by means of flaps, a and b, which are formed respectively above and below the bottom by means of incisions into the sides of the box, substantially as and for the purpose herein shown and described.

71,436.—Stairs.—Noris Adkins, Danbury, Conn.

I claim the combination of the step, a, hinge, b, and spring, c, forming an elastic hinge-spring step, constructed substantially as described and for the purpose set forth.

71,437.—Hydraulic Clock.—Onofrio Abbruzzo, St. Margherita, Italy.

I claim producing the regular motion of the hands of a clock by means of the regular and continuous rise and fall of water in a single vessel provided with a single intermittent discharging siphon and having a continuous influx of water which influx is in relation to the discharge in the ratio of one to two, substantially as described.

71,438.—Hinging Clock Fronts.—Andrew Allen, New Haven, Conn.

I claim hinging clock fronts to the case, substantially in the manner and for the purpose herein set forth.

71,439.—Cotton and Hay Press.—Barnabas B. Alfred, Lagrange, Ga.

I claim the combination of the follow block, D, and press box, B, with a compound screw, c c', resting on a pivot, i, and operating in such a manner that the part, c, screws up and down in the part, c', and the latter screws the press box, B, up and down at the same time causing the follow block and press box to move in opposite directions with the united velocity of both the outer and inner threads of the part, c', in the manner and for the purposes specified.

71,440.—Floor Clamp.—H. D. Barnes, Fair Haven, Conn.

I claim the arrangement of the serrated plate, a, within the arm, C, combined with a corresponding serrated surface of the beam, A, and the set screw, H, constructed and arranged so as to secure the arm C, upon the beam, A, substantially in the manner herein set forth.

71,441.—Lenses for Lanterns.—Edward Barrett (assignor to himself and John F. Burns), New York city.

I claim, 1st, The lens constructed with the cavity, A*, substantially of the form set forth, for the purpose specified.

2d, The combination of the opaque cover or back with the lens constructed as described whereby the lens may be used as a reflector, substantially as herein set forth.

3d, The combination with the within-described lens of the reflector, B, of flaring form, substantially as and for the purpose specified.

71,442.—Knife Sharpener.—Albert B. Bean (assignor to Samuel C. Bradley and Lewis W. Upham), New Haven, Conn.

I claim the combination of the blocks, E and D, of the form described with their holder, C, when secured therein so as to be adjustable to present new edges, substantially as and for the the purpose specified.

71,443.—Inkstand.—E. O. Bennett, Mount Pleasant, Iowa.

I claim the tube, B, made in the manner and used for the purpose herein described.

71,444.—Lantern.—Lewis F. Betts, New York city.

I claim, 1st, Connecting the dome of the lantern with the guards by the intermediate extension piece, c, substantially as recited.

2d, Having a conical reflector extending down over the upper portion of the globe, substantially as set forth.

71,445.—Washing Machine.—John Blackwood, Scranton, Pa.

I claim, 1st, The corrugated perforated board, G, resting upon the springs, e e, in the bottom of the box, A, and used in combination with the carriage, D, in the manner and for the purposes specified.

2d, The carriage, D, with rollers, E E, adjustable by means of the journal bearings having pins, x x, and coil springs, when constructed and operating in the manner and for the purposes set forth.

3d, The box, A, having hinged lid, B, when said lid, is provided with the ways, C C, connected by the pins, a a, with coil springs, and used in combination with the carriage, D, provided with its rollers, b b, in the manner and for the purposes described.

71,446.—Combined Range and Heater.—N. A. Boynton, New York City.

I claim, 1st, The deflector, M, in the air box, C, in combination with the air flues, N, substantially as shown.

2d, Also in combination, the air pipes, N, envelopes, E and I, and smoke flues, J, substantially as shown.

71,447.—Snap for Glass Ware Makers.—Owen B. Brigham, Cambridge, assignor to Young, Haines & Dyer, Boston, Mass.

I claim, in combination with the fixed plates, a and f, the clamp plate, k, so constructed and arranged that the base of the goblet is clamped down against the bed plate, substantially as described.

Also in combination with the plate, f, the neck, r, for directly supporting the goblet bowl, substantially as set forth.

71,448.—Furnaces for Roasting Ores.—William Bruckner, Central city, Cal.

I claim, 1st, Making or arranging the interior of the box or cylinder at an angle with or to the axis of revolution, substantially as described, so that as the cylinder or box is turned the contents will, by their own gravity, roll or slide alternately from one end toward the other at each revolution of the cylinder.

Also making the journals at the ends of the cylinder diagonally opposite to each of the inclines or interior working surfaces of the cylinder.

2d, In combination with a box or cylinder having its journals arranged diagonally to its interior inclines or working surfaces, as described, making openings in the ends or hollow journals for the blaze and heat to enter the cylinder to roast the ores or for supplying and discharging the ores to be roasted.

71,449.—Lamp.—Henry E. Burton, Boston, Mass., assignor to himself, Samuel N. Ufford, and Hezekiah G. Ufford.

I claim, 1st, The combination of two or more decks, A B, the lower one, B, being perforated so as to admit sufficient air to produce the required combustion, the upper deck, A, ogee-shaped, perforated at the base with two or more lines of holes, acting as a cooler to the chimney and cone, inclining toward the wick-tube, p, and extending to within one-quarter of an inch of the top of same.

2d, The combination, with two or more decks, constructed and arranged as described, of the cone, c, and supports, e.

3d, The cones, A B and C, wick-tube, d, and rods, f f, when combined and arranged as described.

71,450.—Pitman.—John Butter, Buffalo, N. Y.

I claim, 1st, Constructing the socket in two parts, F and G, the lower one of which is fastened to the cutter bar, for the purpose and substantially as described.

2d, Constructing the spherical end or ball of the connecting rod of two independent hemispheres, B and D, with interposed packing, E, for the purpose and substantially as set forth.

3d, Providing the socket with an opening or slot, I, for the purpose as herein described.

4th, The spring stop, K, for the purpose and substantially as set forth.

71,451.—Preventing Incrustation of Steam Boilers.—S. G. Cabell, Quincy, Ill.

I claim, 1st, The combination with a steam boiler of an electro-magnet, applied externally, and having its core extending within the boiler and insulated therefrom, substantially as described.

2d, In combination with an electro-magnet constructed and applied to a boiler as described, I claim the use of the screws, n, or wires, n, for making or breaking connection with the boiler shell at will, as set forth.

3d, In combination with an electro-magnet applied externally, I claim the use of a permanent magnet applied internally to the boiler, as herein described.

71,452.—Concealed Hinge.—George R. Cady and William H. Cooper, New Haven, Conn.

We claim securing the arm, E, to the plate, B, by passing the end, d, through, and so as to bear against the shoulder, a, and so that the projection, e, will rest upon the inclined seat, f, and there secured by means of the screw, b, or its equivalent, substantially as herein set forth.

71,453.—Horse Hay Fork.—William Carlton (assignor to himself, Daniel A. Loomis, and Adam Wagener), Adrian, Mich.

I claim, 1st, The roller, E, applied to the retaining face of the catch, D, and adapted to operate substantially as described, for the purpose specified.

2k, The combination of the head, A', having a beveled end, a, latch, D D', roller, E, and spring, b1, arranged and operating substantially as described, for the purpose set forth.

71,454.—Adjustable Scaffold.—P. Cavalier, Plainview, Minn.

I claim the arrangement of the scaffold frame, constructed as specified, with the platform, D, block and tackle, F F, pulleys, J J and K, and pins, E E, substantially as and for the purpose herein set forth.

71,455.—Cutter Heads for Planing Machines.—Wm. H. Christie, Albany, N. Y., assignor to himself and Wm. H. Burton.

I claim a cutter for forming moldings, when formed of a series of plates, B each having cutting teeth, a a, and an elongated slot in which is the mandrel, and upon it the plate can be adjusted, so as to cut any desired shape of molding, substantially as described.

71,456.—Pencil Holder.—N. B. Cooper, Liberty, Ind.

I claim the construction of the pin, A, as set forth, and used in combination with the rubber band, B, in the manner and for the purposes specified.

71,457.—Clothes Pin.—N. B. Cooper, Liberty, Ind.

I claim forming one piece of wire into a clothes pin in such a manner as to leave a circular opening, a, at the top, crossing the ends of the wire below the circle to form the ellipse, b, and again below this ellipse to leave a smaller elliptical space, C, whereby the clothes or line may be held by the spring of the wire, as specified.

71,458.—Electrical Car Starter.—Joseph Clark and Wm. H. Clark, Philadelphia, Pa.

We claim, 1st, The combination of the circuit wheels, C, having different numbers of teeth, with the minute and hour shafts, for giving alarms at different portions of time, arranged and operating substantially upon the principle and in the manner hereinbefore described.

2d, The movable sliding changer, E, having a platinum point, e, in combination with the racks, F and F', for changing the alarm to different portions of time, substantially as specified and shown.

3d, The combination of the hand, H, with the circuit wheels, C, by means of the tube, G, substantially as described, and for the purpose set forth.

4th, The combination of the tube, G, and nut, I, with the circuit wheels, C, and minute shaft, C', for setting the wheels to the starting point, substantially as described.

71,459.—Pneumatic Breast Developer.—James M. Clark, Lancaster, Pa.

I claim, 1st, The combination of the mold, A, conformed to the shape of the female breast, and adapted to completely enclose the same, while pressing only on the sternum, the nipple recess, G, and a suitable exhausting device, for the purposes set forth.

2d, In combination with the above, I further claim the supplemental cup, C, for the purpose set forth.

71,460.—Cane and Lamp Combined.—Thomas Crossley, Bridgeport, Conn.

I claim a cane, staff, crutch, umbrella handle, or other analogous portable article, constructed in two parts, A and A', and enclosing the oil receptacle, B, and wick tube, C, in one part, and the cap, D, and compressing spring, bearing against the latter, in the other part, said parts being arranged substantially as set forth.

71,461.—Water Wheel.—A. H. Crozier, Oswego, N. Y.

I claim the bottom of the curb, having its inner edge, around the scroll-shaped opening therein, curved upward for a portion of the circumference, and curved downward for the remaining portion, substantially as described, and for the purposes set forth.

I claim the openings in the top of the wheel, with valvet opening downward to prevent the water from flowing up, but admitting the air freely downward, to facilitate the escape of the water from the buckets.

71,462.—Spur.—B. A. Davis, Petersburg, Va.

I claim putting two buttons, a a, on both sides of the bow or frame, A, and attaching the strap, E, to both, and the securing strap, F, to the rear button, so as to form the fulcrum of a lever, substantially as and for the purposes herein set forth.

71,463.—Tool for Drilling Metals.—Edward Davies and Richard Hobbs Taunton, Birmingham, England.

We claim the construction and arrangement of a combination drill brace, in the manner and for the purposes hereinbefore described and represented in the accompanying drawing.

71,464.—Canceled.

71,465.—Stoves and Furnaces.—J. B. Driscole, New York city.

I claim a close stove or furnace for burning bituminous coal, containing the following combination: a fire pot, b, to contain the bituminous coal, surmounted by a chamber, a, through which the products of combustion pass away upwards from the fire in the usual way, and air-supply passages, C, which supply all the air admitted to the fire to support combustion, at or as near as may be to the surface of the fire, substantially as described.

71,466.—Brick Machine.—Helmuth Dueberg, New York city.

I claim, 1st, The channels, F F', extending in opposite directions from the tapering spout, E, and carrying the compressed clay to the reciprocating table, H, substantially as and for the purpose set forth.

2d, The feeder, K, in combination with the reciprocating table, H, molds, I I', and press-boxes, G G', constructed and operating substantially as and for the purpose set forth.

3d, The rocking lever, M, carrying the followers, L L', and operating in combination with the reciprocating table, H, molds, I I', and press-boxes, G, G', substantially as and for the purpose described.

4th, The recesses, h, in the press-boxes, G G', to allow the surplus clay to escape, as set forth.

5th, The pieces of flannel, or other absorbent material, supplied with oil from cups, m, in combination with the reciprocating table, H, molds, I I', and followers, L L', constructed and operating substantially as and for the purpose described.

71,467.—Process of Disinfecting Rooms, Ships, and other Structures.—Edward Dumpelmann, Washington, D. C.

I claim, 1st, Disinfecting rooms, ships, water-closets, and other apartments by burning a liquid charged with any chloride salt, decomposable at the temperature of a burning flame, as described.

2d, A liquid for disinfection, being combustible, and containing decomposable volatile chlorides, substantially as described.

71,468.—Fastening for Burial Casket.—Edward S. Earley, Philadelphia, Pa.

I claim the concealed fastening herein described, the same consisting of the plate, C, with slot, a b, and the stud, D c d, applied respectively to the under side of the lid, B, and top edges of the body, A, and operating together substantially as specified and shown, and for the purposes and uses herein set forth.

71,469.—Churn.—Wm. T. Eastes, Madison county, Ind.

I claim the dash, z, substantially as and for the purpose set forth, in combination with the crank, d, the rod, f, the lever, g, and the jointed arm, k x, all connected substantially as described.

71,470.—Escapement for Electric Clocks and Dial Indicators.—Benjamin Franklin Edmands, Boston, and James Hamblet, Jr., Charlestown, Mass.

We claim the construction of an escapement, in which the pallets are resilient, being attached to the end of springs or spring bars, instead of to a rigid bar or anchor piece, so that one pallet will always enter between the teeth on one side of the escape wheel before the other is entirely pushed from between the teeth on the other side of the wheel, and in such manner that the power of the entering pallet renders the action of the pallet first propulsive and then detentive to the escape wheel, substantially as herein described.

The anchor-shaped independent levers, L T T', or their equivalent, to actuate the movement of the pallets, P P', to and fro, and cause them alternately to enter and leave the teeth of the escape wheel, as herein described.

In combination with the resilient pallets and springs, and the bent lever, the binding spring, K, and the stops or guards, V V', substantially as herein described, and for the purpose specified.

71,471.—Machine for Polishing Inner Surface of Tubes.—Leonard Egleston (assignor to Rumsey & Co.), Seneca Falls, N. Y.

I claim, 1st, The combination of the shaft, A, sliding cone, E, crossed levers, C C', and polishers, D, substantially as described.

2d, The combination of the lever, G, yoke, F, shaft, A, cone, E, and crossed levers, C C', substantially as and for the purpose set forth.

3d, The combination of the crossed levers, C C', and polishers, D, when the latter are attached to a pivot, so as to permit their longitudinal oscillation, substantially in the manner and for the purpose set forth.

71,472.—Churn.—Joseph J. Everst, Cumberland, Md., as-

signor to himself and G. P. Gephart.

I claim, 1st, The combination and arrangement of the floor, C, provided with valves, c c', and fitting loosely in the churn, so as to leave a space around its edge, with the vertical pieces, I I, and the dasher, D, substantially as and for the purpose specified.

2d, The combination of the floor, C, having valves, c c', with the dasher, D, so that the dasher is free to revolve, but yet is inseparably attached to the floor, substantially as and for the purpose specified.

3d, The combination of the lever, H, slide, B, pitman, P, and wheel, E, when used to operate the dasher of a churn, substantially in the manner and for the purpose specified.

4th, The dasher, D, having the radical arms, e e, arranged on the shaft, d, substantially as and for the purpose shown.

71,473.—APPARATUS FOR PUNCHING SAW TEETH.—James E. Emerson, Trenton, N. J.

I claim, 1st, The combination of a series of punches with a series of dies, each in its own stock, when so made and arranged that it will punch out the throat of a saw tooth, and a hole, or a series of holes, behind or above said throat, and in a line corresponding to the wear of the saw teeth, and at one operation, substantially as described.

2d, Also, the so arranging of the series of punches and the series of dies in their stocks as that they may be set to punch the throats of saw-teeth, and the series of holes behind or above them, in straight, inclined or curved lines as may be desired substantially as described.

3d, Also making the punches of separate pieces of steel, and fitting them to recesses or grooves in their respective plates substantially in the manner described, so that, when set up in the stock, one plate shall hold the punch of the next adjacent plate, throughout the series, substantially as described.

71,474.—DOOR LATCH.—J. B. Evans, Millville, N. J.

I claim the combination and arrangement of the bolt, B, bent lever, D, spring, E, projection, F, bolt and knob, C, and case, A, as and for the purpose specified.

71,475.—VAULT LIGHT.—Fred. Fitzgerald, Cincinnati, Ohio.

I claim a vault light, having a grooved or otherwise uneven upper surface and an under surface composed of a series of rounded parallel ridges, b c c', of unequal depth, with intervening rounded valleys, d d', as and for the purposes set forth.

71,476.—MARINE TELEGRAPH.—Alfred Foucaut, New York city.

I claim 1st, The hinged segment, d, provided with two armatures, f f', in combination with the index hand, b, and panes, L S, constructed and operating substantially as and for the purpose set forth.

2d, The saddle, i, in combination with the spring, h, hinged segment, D, and index-hand, b, substantially as and for the purpose described.

3d, The spring studs, q* r*, in combination with the segment, d, electro-magnets, g g*, electro magnetic alarm bells, S* L*, constructed and operating substantially as and for the purpose set forth.

4th, The lid, j, and "course" pane, C, in combination with the electro-magnet, n, armature, m, and switch, D*, constructed and operating substantially as and for the purpose described.

5th, The alarm bell, C* in combination with the lid, j, pane, C, electro-magnet, n, and switch, D*, constructed and operating substantially as and for the purpose described.

6th, The switch, U, in combination with the rudder-head, R, and electro-magnetic alarm-bells, H H*, in the commander's box, B, substantially as and for the purpose described.

7th, The regulator, W, carrying non-conducting segments of different length, in combination with the switch, U, and rudder-head, R, constructed and operating substantially as and for the purpose described.

71,477.—LUBRICATING ROLLER IN SPINNING MACHINES.—F. C. Fuller, Lowell, Mass.

I claim the central passage, e, and oil holes, c, and n, in the arbor, a, of the shell-rolls, for the purpose and substantially as described.

71,478.—GATE AND DOOR SPRING.—J. C. Gould, Oxford, N.J.

I claim the combination of a spring and link, or its equivalent, with a yoke a b, curved substantially as described and for the purpose specified.

71,479.—ALLOYS FOR MAKING PLATES AND SHEETS.—J. D. Grüneberg, Spring Mills, N. J.

I claim the within described article of metal, made from the metals, and of the proportions, and by the means, and in the manner substantially as specified.

71,480.—LOOM.—Fred. Haigh, Methuen, Mass.

I claim the combination of the shaft, d, and its arms, f g, with the puppet, l, and the slider, k, its studs, h l, spring, n and collar, m, the whole being applied together as and for the purpose or objects specified.

Also, the combination of such mechanism, or its equivalent, with the loom frame and lay, to operate with the shuttle as specified.

Also the combination of the stop-screw, o, and cross-piece, p, with the shaft, d, and its arms, f g, the puppet, l, the slider, k, its studs, h l, spring, n, and collar, m, or the equivalents thereof.

71,481.—DETACHABLE OVEN AND DRUM.—C. A. Harper and Isaac A. Crane, Rahway, N. J.

We claim 1st, In combination with the external case, A, and internal oven, D, the flanges, E, located as described, pipe, G, and damper, H, for the purpose of effecting distribution of the heat, substantially as set forth.

2d, In combination with the external casing, A, and oven, D, we claim the door, I, with the lower and upper series of openings at K and K', and the plate, L, so placed as to leave the space, L', at the back of the oven, substantially as and for the purpose set forth.

3d, In combination with the external case, A, oven, D, and pipe, B, we claim the plate, B', arranged to operate substantially as and for the purpose set forth.

71,482.—FORGING CUTLERY.—H. B. Harvey, West Meriden, Conn.

I claim, 1st, The combination of the two rolls, C and D, each having a recess or die formed in its face, the one corresponding to the other, and arranged so as to receive and form the blank for cutlery, substantially as herein set forth.

In combination with the above, an automatic feeding device, constructed and arranged substantially as described so as to introduce the blanks to the rolls at the droper time.

71,483.—BRIDGE.—Peter Hendricks, Floris, Iowa.

I claim 1st The combined wire suspension-chain or cable and truss-bridge, constructed substantially in the manner herein described and shown.

2d; The twisted wire stirrups, F, applied substantially in the manner and for the purpose described.

3d, The combination of the wooden trusses, B2 N, braced, stayed, and anchored substantially as shown, with the wire suspension chain or cable, D, wire stirrups, F, and the platform, K, all substantially as described.

71,484.—TRUSS BRIDGE.—G. P. Herthel, Jr., St. Louis, Mo.

I claim 1st, The combination of the last piece, s, of the upper chord, A, with the end bolt, C', the lower chord, C, the queen bolt, D, the compression post, E, and tension-post rod, G, and king-bolt, B, substantially as and for the purposes set forth.

The end bolt, B', in combination with the rollers, b, and the chords, A, and C, substantially as set forth.

3d, The general combination of the upper chord, A, the lower chord, C, post-rods, G', posts, E, and braces, F, substantially as set forth.

71,485.—ENAMEL AND LEATHER.—Sanford A. Hickel, Spencer, W. Va.

I claim the combination of the above materials or ingredients in the proportions named, and the resulting compound: the improved enamel finish, and the application of the same to leather, wood, iron, steel and cloth.

71,486.—APPARATUS FOR KILLING INSECTS.—Henry Hill and Llewellyn E P. Bush, Lexington, Ky.

We claim the heater, A, provided with the flue, B, cylinder, K, and adjustable tubes, g f, as and for the purpose set forth.

71,487.—HOOP SKIRT.—F. Hull, Birmingham, Conn.

I claim the attachment of hoops to vertical tapes by means of the springs inserted so as to pass through the pocket in the vertical tape, while the covering of the wire is upon the outside of the pocket in the vertical tape, substantially as herein set forth.

71,488.—SEED PLANTER.—Samuel C. Hunter, East Hickory, Pa.

I claim the construction of a seed planter, with the dropping boxes, C C, constructed as described, in combination with the lever, E, and the eccentrics, N N N, and the false wheel, B, and the covering plows, P P, when the same are constructed as described, in the aforesaid combination, for the purposes set forth.

71,489.—CHURN.—Patrick Hutchinson, Boston, Mass.

I claim the arrangement and combination of the two bent levers, E E', their connecting rods, F F', single adjustable crank pin, G, and slotted crank, H, together and with the driving shaft, the two churn dashers, D D', and the gallows frame, C, the whole being substantially as specified.

71,490.—WATER HEATER FOR STOVES.—G. L. Ingersoll, Cleveland, O.

I claim a cylindrical boiler or boilers, A, connected to each other by pipes, H, and provided with induction and eduction pipes, I I, when enclosed within a case, F, with or without the extension bottom, C, in combination with the stove, A, for the purpose and in the manner substantially as set forth.

71,491.—KNIFE AND SCISSORS SHARPENER.—J. Nelson Jacobs, Worcester, Mass.

I claim, 1st, The combination of the slots, E and F, the file, B, screw, D, and plate, C, as and for the purpose specified.

2d, In combination with the above, finishing the ends of the blocks of wood by covering the same with flock, emery, or other like fine fibrous or granular substance, for the purpose specified.

71,492.—APPARATUS FOR APPLYING CLASPS TO SKIRTS.—James Jenkinson, Brooklyn, N. Y.

I claim, 1st, The combination, with a supply box or hopper, A, and stationary inclined feed board, C, of the preparatory or intermediate feed board or plate, B, made adjustable as regards the inclination of its surface, substantially as specified.

2d, The turnover plate, J, in combination with the guide bar, I, for operation essentially as and for the purposes herein set forth.

3d, The arrangement of the slot, e, in the inclined feed board or plate, C, with relation to the divider, K, for action together, as herein set forth.

4th, The divider, K, hinged at its outward end, so as to be capable of being raised for the passage of the dirt or clearance of an imperfect spangle without removing the gate, substantially as specified.

71,493.—CORN PLANTER.—Joseph John, Massillon, O.

I claim, 1st, The arrangement of the shafts, E and F, clutch, T, wheels, G and H, shaft, I, wheel, L, and spout, M, in the manner and for the purpose set forth.

2d, The arrangement of the cam block, Q, with the bar, P, roller, O, and spring, a, as and for the purpose set forth.

71,494.—MANUFACTURE OF SALT.—Clarkson F. Johnson, East Saginaw, Mich.

I claim, 1st, constructing a narrow pan or trough, A, or its equivalent, for carrying the brine in the most heated route from the boiling box, B, in front, back through the smoke stack, C, and emptying it into the rear end of the unsettled or lower body of brine, D.

2d, Making large openings, E, in the front end of the crystalizing pan, F, and on either side of the boiling box, B, to prevent the pressure upward and leakage of the unsettled or lower body of brine on the crystallizing pan, F.

3d, Constructing a vat bottom in the way and manner set forth in the drawings.

71,495.—SHAPING THE SOLES OF BOOTS AND SHOES.—Joseph B. Johnson, Lynn, Mass.

I claim the combination of the mold, the press, the last, and the elastic bottoming of the latter.

Also, the combination of the presser with the press, the mold, and the last and its elastic bottoming, as set forth.

71,496.—TUBE WELL.—J. Dwight Kellogg, Jr., Northampton, Mass.

I claim the removable slotted interior tube, C, having the ball, r, and flanges, e e', adapted to contain the enclosed filtering substance, I I, when used in combination with the well tube, A, substantially in the manner and for the purposes specified.

71,497.—MACHINE FOR ROUNDING UP SOLES.—Wm. H. N. Kimball, Lynn, Mass.

I claim for use with a pattern and a knife and a feeding mechanism, such an arrangement of a gage for the pattern to bear against that the chip cut will pass beneath the gage, so as not to obstruct the view of the operator, thus enabling him to keep the pattern always in contact with the gage, substantially as described.

71,498.—BENCH VISE.—Charles L. Kingsley (assignor to Charles Parker), Meriden, Conn.

I claim the plate, D, constructed with the channels as described, and arranged upon the projection, C, on the jaw, B, so as to be adjusted thereon in the manner specified.

71,499.—PROCESS OF CLEANING COTTON SEED.—John Kirkman, Peoria, Ill.

I claim the process of cleansing cotton seed by the action of sulphuric or other acid, either separately or combined, substantially as and for the purpose above described.

71,500.—DEVICE FOR CLEANING STOVE PIPE.—Warren J. Nace (assignor to himself and George L. Hafer), Tippecanoe City, Ohio.

I claim the provision in a stove pipe of the crank rod, D, loaded disk, F, ball, I K, and chains, J and L, the whole being arranged and adapted to operate as set forth.

71,501.—FURNACE FOR STEAM BOILERS.—John F. Myers, Noah Leas and Worley Leas, Kokomo, Ind.

We claim, 1st, the combination of the vertically sliding damper, D, chamber, G, and doors, G', for the regulation of the draughts, said parts being arranged substantially as set forth.

2d, The combination of the vertically sliding damper, D, with the pipes, D2, having valves, D1, when arranged to control the course of the draught, substantially as set forth.

71,502.—ATTACHING KNOBS TO THE SPINDLES OF DOORLOCKS.—Wallace T. Munger (assignor to Thomas Kennedy), Branford, Conn.

I claim the combination of the collar, d, with the neck, F, of the knob, provided each with corresponding shoulders, arranged and combined with the plate, G, so as to operate to secure the knob, substantially in the manner and for the purpose herein set forth.

71,503.—GATE.—Theodore Munger, Jaynesville, Iowa.

I claim the adjustable pieces, e e' e'', in combination with the gate, G, substantially as and for the purpose shown.

71,504.—BED BOTTOM.—Leander Mudge, Springfield, Ohio.

I claim a bed bottom, constructed with a small cord, G, traversing the space between the side rails, passing around pulleys, B, attached to the latter at close intervals, and connected at one end to the bedstead, or to a spring, C, and at the other to a tightening axle, D, substantially as described.

71,505.—MAGIC WATCHCASE.—Edward A. Muckle, Philadelphia, Pa.

I claim, 1st, The inside case, E, rotated by the pendant, F, substantially as described.

2d, The pendant, F, journalled in the center, B, and having secured to it the rotating inside case, E, substantially as and for the purpose described.

3d, The pusher, G, protruding at the side of the pendant, F, above its end, substantially as described for the purpose specified.

71,506.—APPARATUS FOR CONVERTING ROTARY INTO RECIPROCATING MOTION.—Duncan Morrison, Portland, Me.

I claim the arrangement of the several devices hereinbefore described, to wit, the swinging arm, a b, shaft, c, gear, d, shaft, f, wheel, h, gear, e, connecting rod, l, saw frame, k, lever, p, bed, r, in and upon the frame, A, to constitute a convenient means of working a wood saw, substantially as specified.

71,507.—PLOW.—Gilpin Moore, Moline, Ill.

I claim, 1st, A movable wedge bolt, arranged to operate as described, for adjusting the beam of a plow laterally, substantially as set forth.

2d, A cast standard, having a slot or recess formed therein to receive the movable wedge bolt, and used in combination therewith for adjusting the beam of a plow, substantially as described.

71,508.—METHOD OF MANUFACTURING TUBULAR BODIES.—James Montgomery, Croton, N. Y.

I claim the construction of hollow, wrought-metal bodies, by combining with segmental or main bars, a, intermediate double-headed bars, b, and afterwards welding the same together, substantially as specified.

71,509.—AWNING.—S. Miller and J. S. McClellan, Champaign County, Ohio.

We claim the combination of extension arms, G, spiral spring, H, canvas, A, boards, K, and cord, l, the whole constructed and operating as described, and for the purposes set forth.

71,510.—VALVE FOR WATER CLOSET.—Charles H. Miller, Buffalo, N. Y., assignor to Charles H. Harrison, New York city.

I claim, 1st, The adjustable piston, D, in combination with the valve, C, and cylinder, B, substantially as described.

2d, The removable cylinder, B, arranged in the body of the faucet, and forming a water chamber above the piston, for the purpose and substantially as described.

71,511.—FOLDING OR LUNCH BOX.—George B. Mershon, Philadelphia, Pa.

I claim the arrangement of the sides, A B C D, and ends, E and F, and hinges attached to the sides, D, E and F, completed by the pins, I I, when the box is in form for use, and the parts, K K, for the purpose of closing the box, in connection with the pins, I I, and the hinging at the ends of the side, D, when folded.

71,512.—MACHINE FOR TAPPING BOLTS.—E. M. Mayo, Cincinnati, Ohio.

I claim the die-holding levers, C, pivoted to the head, B, secured to the end of a hollow mandrel, a, connected by the links, D, to the sliding collar, E, and the lever, G, all arranged to operate as shown and described.

71,513.—PLOW.—Elbridge G. Matthews, South Natick, assignor to Frank F. Holbrook, Boston, Mass.

I claim, 1st, The arrangement of the arm, A, its flanges and shelf, c, or their equivalents, with the plow standards, S, and its base, a, as described.

Also, the arrangement of the tooth, I, and the buttress, g, with the plow-standard and its shoes, as set forth.

Also, the plow-standard as made with an arm to extend back and up from its base, so as to give support to the two handles and beam, substantially as set forth.

71,514.—PORTABLE GAS APPARATUS AND CARBURETER.—John MacDougall, New York city.

I claim, 1st, The air tube, o-p, arranged around the shaft, e, at the place where it passes through the end of the rotating vessel, substantially as described.

2d, Arranging the mouth of the branch, p, of the air pipe, o-p, in such a manner that it opens downward over the surface of the oil, substantially as described.

3d, The floating hinged valve, q, arranged substantially as described, under the mouth of the air pipe, o-p.

4th, The escape pipe, r, for the discharge or escape of condensed matters from the pipe, o-p, substantially as described.

5th, The application of a valve or cover to the outer end of air pipe, o, to close it when the apparatus is not in operation, so as to prevent the escape of vapor, substantially as specified.

6th, Enclosing the geared end of shaft, e, within a jacket, and setting the shaft of the gear that drives said shaft in the upper part of the jacket, so as to prevent the oil from leaking at the end of shaft, e, substantially as shown.

7th, The inclined double bottoms, 6, in the oil containing vessels, h j, or either of them, substantially as and for the purpose described.

8th, The U-shaped pipe, n, leading from the supply tank, j, and terminating in the outer apartment, m, substantially as described.

9th, The air conducting tube, l, leading from the air space of tank, j, and terminating in the outer apartment, z, when its lower end is cut off at an angle, substantially as and for the purpose described.

10th, The arrangement of the inverted conical valve, x, in the pipe, t, in such a manner that its base closes the valve opening of said pipe, and its narrow end operates to guide the valve, and keep it straight in its movements, substantially as shown.

11th, The connection of the top of the receiving vessel, t, with the valve, x, by means of a rigid arm, y, whereby the valve is moved back and forth by positive force, substantially as set forth.

71,515.—LAMP FOR KINDLING FIRES.—Shederick J. Lowe, Quincy, Ill.

I claim, 1st, A lamp provided with a traversing adjustable wick tube, that may be moved or slid in and out when required.

2d, Making the traversing adjustable wick tube of a lamp curved, substantiallially as described for the purposes set forth.

3d, In combination with the oil vessel I claim the case, C, for holding and guiding the wick tube, substantially as described.

4th, In combination with the traversing wick tube, I claim the hinged slotted plate, ... and ring, K, for holding the wick tube, as described.

5th, I claim in combination with the oil vessel, the shield or guard plate, Q, arranged in front to keep the heat of the fire kindled from heating the oil vessel.

6th, I claim the partition in the oil vessel to hold the oil back when the lamp is tipped, and prevent it from running to the wick so freely as it would do if there were no partition.

71,516.—FELTING MACHINE.—Wm. Lodge and Hiram Platner, Danbury, Conn.

We claim, 1st, The combination of the boards, D and E, one or both having a reciprocating motion, as described, with an apron or pocket, G, for holding the goods to be felted, arranged and operating substantially as specified.

2d, The combination with the felting boards, D and E, and apron, G, of the take-up or adjusting roller, d, to the latter, substantially as specified.

3d, In combination with the felting boards and aprons, G, the treadles, h, for effecting the delivery of the goods from the bath, essentially as described.

71,517.—HOT AIR FURNACE.—Robt. Z. Liddle, Brooklyn, N. Y.

I claim, 1st, The combination with the main body of a furnace constructed substantially as described, of a single or double feeder, substantially as and for the purpose set forth.

2d, Extending the conducting pipes or channels, I I I, or their equivalents, for supplying the double feeder with air through the walls or casing which incloses the furnace and into the cold air space beyond said wall or casing, so as to supply said feeder with cold air, substantially as hereinabove set forth.

3d, The combination in an air heating furnace containing a single or double feeder, of the annular flue or ring, R, with short pipes or connections, C, connecting the smoke chamber, with said ring, said short pipes or connections and ring being surrounded by air passages, substantially as described.

4th, The combination in an air heating furnace containing a single or double feeder, of the sliding damper, N, with the annular flue or ring, R, and short pipes or connections, C, substantially as described.

5th, Closing or reducing the size of the openings through one or more of the short pipes or connections, C, in an air heating furnace containing a single or double feeder to equalize the draft from the combustion chamber, and to shut off direct communication from the combustion chamber to the exit pipe, substantially as described.

71,518.—DRY GAS METERS.—Charles C. Lloyd, Philadelphia, Pa., assignor to the American Meter Company, New York, Philadelphia, and Boston.

I claim, 1st, Making the flagstaff, C, and its horizontal arm, c', in one piece, by bending it as described and set forth, for the purpose specified.

2d, Connecting the flag, D, to the bellows disk, E, by means of a hinge joint consisting of the vertical stem, f', and the brackets, f'' and f''', when the said parts, 1' f'' f''', are constructed and connected together in the manner described and shown, for the purpose specified.

3d, Also maintaining the requisite parallelism between the bellows disk, E, and the partition, a', during the motions of the former, by means of the coupling arrangement, G G' G'', combined therewith substantially as and for the purpose described.

71,519.—CLOCK.—William Lindon, New Haven, Conn.

I claim the arrangement of the cam, S, combined with the bar, H, and the hammer, I, so as to operate in the manner substantially as set forth.

71,520.—MEANS FOR MEASURING AND LAYING OUT GARMENTS.—Jacob Lemley, Jr. (assignor to himself, I. W. Yeakell, and C. O Kline), Newtown, Va.

I claim the combination of the formers on which are indicated a single table of measurements, with a series of graduated scales, said scales being entirely independent of each other and of the former, but so arranged as to be susceptible of being readily attached to and detached from the former, substantially as described.

71,521.—NAIL PLATE FEEDER.—E. B. Lake, Bridgeport, N. J.

I claim, 1st, The barrel, C, constructed substantially as described, in combination with the devices herein described, or their equivalents, for imparting to the said barrel a combined rotary, longitudinal, and vibratory motion, for the purpose specified.

2d, The above in combination with the vibrating plate, B, swinging frames, b and f, and rings, c and e, for vibrating the barrel, C, as described.

3d, The casing, F, substantially as described, turning in the hinges, j and j', and arranged on plate, D, to slide on the vibrating plate, B, in the manner and for the purpose specified.

4th, The casing, F, combined and operating in conjunction with barrel, C as specified.

5th, The box, G, adapted to an opening in the casing, F, when arranged to slide in the same, substantially in the manner described.

6th, The above in combination with the spring, n, and its flap, n', for holding and guiding the plates, X.

7th, The combination of the pulleys, p and p', the band, q, its projections, q', and the spring, w, the whole being constructed, arranged, and operated substantially as described, for propelling, holding, and guiding the nail plate.

8th, The rollers, v v' and the springs, y y1 and y2, within the passage, z, combined and arranged as and for the purpose specified.

9th, The lugs, u, of the spindle, r', combined with the adjustable sleeve, t, and spring, t'.

71,522.—HORSE POWER.—J. A. Leibey, Davenport, Iowa.

I claim constructing horse-powers with a single driving shaft, f, extending under the master-wheel, out at each side, and provided with a coupling at its opposite ends, substantially as and for the purpose set forth.

71,523.—FAGGOT FOR RAILROAD RAIL.—Wm. Leighton, Wyandotte, Mich.

I claim the V-shaped socket, A, and the V-shaped block, C, on the pile of flats, B, substantially as and for the purposes specified.

71,524.—STOVEPIPE DAMPER.—Harrison Ogborn, Richmond, Ind.

I claim 1st, The plate, F, provided with end pieces, f, sliding in the slot, c', and d2, substantially as described.

2d, The slots, c', in the cross-plates, C', substantially as and for the purposes described.

3d, The slots, d2, in the parts, d1, of the bearings, D D', substantially as and for the purposes described.

4th, The combination of the plate, F, provided with end pieces, f, the cross plates, C', provided with slots, c', and bearings, D D', the parts, d1, of which have slots, d2, substantially as and for the purposes described.

5th, The combination of the cone-shaped plates, B and B2, circular plate, B1, provided with an opening, b, sliding plate, F, with end pieces, f, cross-plates, c c', the latter provided with slots, c', and bearings, D D', with grooves c, and consisting of parts, d d1, the latter having slots, d2, substantially as and for the purposes described.

71,525.—COMBINED CULTIVATOR AND POTATO DIGGER.—J. D. C. Outwater, Newark, N. J.

I claim 1st, Casting the shoe with a slotted cylinder, or its equivalent, on its under surface, substantially as described and for the purposes set forth.

2d, The cylinder, cast on the under surface of the shoe, in combination with the tines, K K, and rod, c, when the same are constructed, arranged, and operated substantially as described.

3d, Operating the tines, K K, by means of a shaft, G, having pins, d d, said pins being constructed with or without slotted or bevelled heads, when the same are arranged substantially as described.

4th, The shaft, F, constructed with pins, d d, when said pins are so arranged as to work between the tines, K K, substantially as described and for the purpose set forth.

5th, The main shaft, E, having one or more ground or driving-wheels attached, one of said wheels being furnished with cogs, substantially as described and for the purpose set forth.

6th, Constructing a potato-digger with land sides, C C, substantially as described, and for the purpose set forth.

7th, The brace-rod or cutter, P, when the same is arranged substantially as described, and for the purposes set forth.

8th, The diagonal brace-rod, S, when the same is constructed and arranged substantially as described, and for the purposes set forth.

9th, The slotted brace-bar, D, arranged between the land sides, C C, when the same is constructed and arranged substantially as described.

10th, Securing the beam above the land sides, C C, by means of the braces, M M, when the same are combined and arranged substantially as described.

11th, Securing the cultivator-shares, b b, to the land-sides, C C, when the same are constructed and arranged substantially as described and for the purpose set forth.

71,526.—WASHING COMPOUND.—H. A. S. Park, and J. H. Van Pelt, Cumberland, Md.

We claim, 1st, A "detergent compound," of which the hyposulphite or hyposulphate of soda is an ingredient.

2d, The combination of the hyposulphite or hyposulphate of soda with the bicarbonate of soda in equal quantities so as to form a detergent compound substantially as and for the purpose specified.

71,527.—ANTI-FRICTION JOURNALS FOR CAR WHEELS, ETC.—Charles H. Parshall, Detroit, Mich.

I claim, in combination with the pedestals and axle of a railroad car, two anti-friction bearings, constructed substantially as set forth, and also a tight and a loose wheel the latter turning upon a similar bearing, substantially as and for the purpose set forth.

71,528.—GRAIN DRILL.—Charles E. Patric and Lyman Bickford, Macedon, N. Y.

We claim, 1st, The distributors provided with the enlarged seed runs or passages having the contracted throat or gage formed therein, for the purpose set forth.

2d, The concave depression or sink formed in the distributor shell above the discharge outlet or opening, for the purpose set forth.

3d, The upper flanges of the distributor shell or castings formed or cast with the slots or notches, p, substantially as and for the purpose set forth.

4th, The manner of forming the axis or bearings of the distributor wheel by means of annular flanges or grooves formed in the adjacent faces of the casings and wheel, substantially as described.

5th, The vertical distributors provided with a double feed and operated by means of a square shaft, or its equivalent, in combination with a slide hopper bottom for adjusting or regulating the feed, as set forth.

6th, The "wind guard," P, in combination with the vertical distributors, applied and operating substantially as described.

7th, The lifting bar, L, secured in the described relation to and in combination with the angle irons, M, substantially as and for the purpose set forth.

8th, The angle irons, M, to which the lifting bar is attached provided with the horizontal flanges or stops, m2, substantially as and for the purpose set forth.

9th, The combination of lifting bar, L, angle irons, M, and lifting lever, N arranged and operating as described with the drill tubes, in the manner and for the purpose set forth.

10th, The employment of the short stationary axles, C, attached to the outer frame bars and to the short inner ties or bars, A2, in the manner and for the purpose set forth.

71,529.—APPARATUS FOR SPONGING CLOTH.—John R. Paul, Philadelphia, Pa.

I claim the adjustable perforated horizontal cylinders, D E, constructed, arranged and operating as above described.

71,530.—ICE RACK FOR REFRIGERATORS.—Henry Pennie, New York city.

I claim the use of the cross cleats, B, for the purpose specified, in a corrugated metallic ice rack, substantially as described.

71,531.—MOLDING MACHINE.—O. H. Perry, Cincinnati, O.

I claim the cutter head, C', adjustable guides, L and K, slotted table, A', and saw, M, when arranged in relation to each other, and operating substantially as and for the purpose described.

71,532.—CIGAR MACHINE.—John Prentice and William F. Wuterich, New York city, assignors to John Prentice.

We claim, 1st, The shaft, o, with the cranks, 4, and links, 5, to the boxes, 2, of the shaft, n, for drawing back the roller, m, as set forth.

2d, The roller, p, mounted on arms, p', from the shaft, o, in combination with the rollers, d e and m, as and for the purposes set forth.

3d, The roller, m, in combination with a mold for forming the tip, substantially as specified.

4th, The arrangement of the gears, s t and r, in combination with the worm, q, shaft, t', and ratchet wheel, s', as set forth.

5th, The ratchet wheel, s', and its pawl 8, constructed as set forth, in combination with the gearing, s t and r, and rollers, d e and p, as set forth.

6th, The moving section, i i, and tip mold or die fitted and operating substantially as and for the purposes set forth.

71,533.—CIDER PRESS.—Enoch Primm, Petersburgh, Ill.

I claim the combination of pulley wheels, C and D G and H, arranged as set forth in combination with sliding frame, A, fixed frame, B, gear wheels, F and O, drum, K, crank, I, spring, N, spring catch, P, and ropes, E I, all arranged in manner and for the purposes substantially as described.

71,534.—DOOR LOCK.—Reinhard Schade, New York city.

I claim the combination of the tumblers, D, each provided with three slots, d e f, and passage way, g h, double bit key, C, bolt, B a, lug, c, and springs, E, or equivalents therefor, the whole arranged and operating substantially as and for the purpose herein specified.

71,535.—LOOSE PULLEY BOX.—C. Purdy, Bedford, Ohio.

I claim the cylinder, B, provided with annular grooves, h h, and openings, e e, which lead into the chamber, I, constructed as described, and having wicking, a a, the whole constructed and operating in the manner and for the purposes described.

71,536.—PURIFYING BONE BLACK.—T. H. Quick, N. Y. city.

I claim, 1st, The flue, B, provided with separate shelves or spouts, c, arranged spirally round the interior thereof for operation in connection with a suitable feed or distributor, and escape or dust pipe, substantially as specified.

2d, The combination of the cap, D, having channel ways, b, with the shelves, c, of the flue, B, arranged relatively to each other for operation together, as herein set forth.

71,537.—BURGLAR ALARM.—Tobias Royer, Lancaster, Pa.

I claim, 1st, The arrangement and combination of the hook lever, J, cross lever, R, and notched stop wheel, I, in the manner and for the purpose specified.

2d, In combination with the levers, J R, I also claim the short levers or arms, 1', 2', 3', 4', etc., connected with the covering plates, I, II, III, IV, etc., together with the combined cords or wires, 1' r 2' r 3' r 4' r, etc., arranged in the manner and for the purpose set forth.

3d, Also, the combined segment rubber, L, with its attached pulley, K, provided with an arm, W, and weighted strap, k k', in combination with the spring jaw match holder, N n Q, and bent wire, P, arranged in the manner and for the purpose described.

4th, Also, the combined arrangement of the hook lever, J, notched wheel, I, double ratchet wheels, G F, with its spring pawl, hammer, and bell connection, all arranged and operated substantially in the manner and for the purpose specified.

73,588.—LAMP CHIMNEY FASTENING.—Edwin Russell, Naugatuck, Conn.

I claim, 1st, The annular groove, s, formed upon or attached to the base of the chimney, substantially as described.

2d, The rotating hook, s, constructed and arranged to operate so as to secure the chimney to the lamp top, substantially as described.

71,539.—HUSKING MACHINE.—Jacob Russell, Brooklyn, assignor to himself and Samuel Moffatt, Albany, N. Y.

I claim, 1st, The hollow metallic roller frame, m, formed with a gear wheel, c', and recessed for the reception of the filling, substantially as and for the purpose specified.

2d, The elastic filling, r, in combination with the roller frame, substantially as and for the purpose specified.

3d, The scraper or scrapers, A', arranged above and in relation to a pair or pairs of husking rolls, B, constructed substantially as and for the purpose specified.

4th, The combination of the guide, c, having spurs or extensions, cx, with the husking rolls, B, substantially as and for the purpose specified.

71,540.—CORN AND SEED PLANTER.—Martin M. Rutt and Adam S. Baer, East Hempfield, Pa.

We claim, 1st, The arrangement of an oscillating disk, C, with its exserted ears and arms, a, operating in a hopper provided with several compartments, in the manner and for the purpose specified.

2d, In combination with the disk, C, and its arm, a, the connecting rod, L, with the arm or rod, M, actuated by the grooved cam, H, all arranged and operating substantially in the manner specified, the use of the spouts, K, and appliances shown and specified.

71,541.—TEMPLES FOR LOOMS.—Edgar F. Shaw, Boston, Mass.

I claim, 1st, A temple, consisting of two tapering rolls, arranged relatively to each other and to the web, substantially as herein shown and described.

2d, The combination of the taper rolls, D D, with the bar or beam of the temple, constructed in two parts, for support and adjustment of the rolls, or one of them, relatively to the other, essentially as specified.

3d, The combination of the taper rolls, D D, arms or brackets, C C', temple beam, made up of a stationary part, A, and movable portion, B, hinged as at a, and made capable of adjustment or separation, as a loose jaw, by means of a screw, E, or its equivalent, substantially as and for the purposes set forth.

71,542.—VALVE FOR STEAM ENGINE.—Jacob Shoemaker, Oakland, Pa.

I claim the arrangement of the induction pipe, E, and the eduction pipe, F, with reference to the valve seat, C, valve, D, and ports, E, when constructed substantially in the manner set forth.

71,543.—ANIMAL TRAP.—T. Silliman, Three Rivers, Mich.

I claim, 1st, The combination with the revolving table of the bait lever, the holding spring, D, and the friction roller, F, when all these parts are constructed and arranged as described for joint operation.

2d, The combination of the table, the bait lever, and the holding spring with the balanced stop lever, C, constructed, arranged, and operating as described.

3d, The combination of the revolving table, the bait lever, the holding spring, and the balanced stop lever, with the box, A, the passage, G, the swinging door, h, the cage, H, and the tipping floor, K, when all these parts are constructed and arranged as described for joint operation.

71,544.—MACHINE FOR CUTTING AND GRINDING ANIMAL MATTER.—Amor Smith, Cincinnati, Ohio.

I claim, 1st, The combination of two metallic rollers with interlocking ribs, square upon their edges, arranged for use substantially in the manner and for the purpose set forth.

2d, The mode of feeding the animal matter to the shearing ribs by means of notches, B2, on the periphery of the ribs, substantially as set forth.

71,545.—CUTTING MACHINE FOR REDUCING CRACKLINGS, etc.—Amor Smith, Cincinnati, Ohio.

I claim the combination of the wheel, A, with cutters, C, box, B, and compressing head, F, substantially as and for the purpose set forth.

71,546.—BALL CASTER.—T. S. Smith, New Haven, Conn.

I claim the seat, A, constructed with a recess, B, so as to form an angular recess, said recess forming a single bearing point on the top, and two driving points, a, near the top of the ball, as set forth.

71,547.—STEAM CUT-OFF VALVE.—William M. Stevenson, Sharon, Pa.

I claim the arrangement of the valve boxes, A and B, boxes, C C, and the eccentrics, m and s, with their rods, t and h, the whole constructed and operating as herein specified.

71,548.—TOBACCO PIPE.—J. B. Stockton, Edmonton, Ky.

I claim a smoking pipe, constructed, arranged, and operated in the manner as shown and described and for the purpose set forth.

71,549.—MEDICINE.—Harriet E. Taylor, Saratoga Springs, N. Y., Executrix of the estate of T. H. Taylor deceased.

I claim the pills composed of the ingredients herein set forth, in about the proportions specified.

71,550.—MUSIC STAFF.—Virgil C. Taylor, Des Moines, Iowa.

I claim the method of indicating the key note in music, substantially as set forth.

71,551.—CORN SHELLER.—Simeon Terry, Boscawen, N. H.

I claim in combination with box, A as constructed, the adjustable apron-block, B, by the screws, E E, the apron, B', with its metal staves, a', secured upon the raised point, c, arranged and operating with the cylinder, C, in the manner and for the purposes set forth.

71,552.—DUMPING CAR.—Edward Thompson, Hokah, Minn.

I claim, 1st, The method of unloading cars, substantially as described.

2d, The use of a scraper, substantially such as described, when arranged to operate in connection with railway cars, for the purpose of removing therefrom the gravel, earth, sand, or similar material with which they may be loaded, substantially as herein set forth.

71,553.—APPARATUS FOR CONSTRUCTING RAILROADS.—Edward Thompson, Hokah, Minn.

I claim, 1st, Operating the scrapers by means of lines and blocks, substantially as described, for the purpose of moving earth, gravel, and similar material, as described.

2d, The platform constructed and arranged to operate in connection with scrapers, as and for the purposes set forth.

71,554.—CLAMP STRAP FOR SCHOOL BOOKS.—Louis F. Van De Wiele, Brooklyn, N. Y.

I claim the adjustable angular plates, B, in combination with the strap, A, substantially as and for the purpose specified.

71,555.—FEATHER RENOVATOR.—Uriah B. Waddle, Cleveland, Ohio.

I claim, 1st, The drying pipes, I, arranged with a stationary cylinder or case, A, in combination with the arms, D, and shaft, C, when operated in the manner as and for the purpose set forth.

2d, The steam pipes, K L, conductor, P, provided with a screen, Q, as arranged in combination with the case, A, for the purpose and in the manner as set forth.

71,556.—WASHING MACHINE.—Moses P. Walton, Marlboro, O.

I claim the shaft, I, with crank, H, and fly wheel, J, and the connecting rod, F, when used in connection with the crank, D, on shaft, C, of beater, G, substantially in the manner and for the purpose herein specified.

71,557.—SEEDING MACHINE.—S. B. Ward, Auburn, Ind.

I claim, 1st, The combination of the seed slide, K, with roller, L, and the wheel, A, the latter being constructed with spurs to perform the double function of actuating the seeding mechanism and marking hills, substantially as set forth.

2d, The combination of the wheel, A, with spurs, A', and scrapers, C, arranged as set forth.

3d, The combination of the seeding mechanism and the adjustable plows, harrows and covering flanges, substantially as set forth.

4th, The combination and arrangement of the harrows, G'", straps, G", and hinged standards, F, and lever, F", arranged to operate substantially as set forth.

71,558.—RAILWAY CAR APRON OR DUSTER AND BRIDGE.—William H. Ward, Auburn, N. Y.

I claim, 1st, The adjustable apron or duster, when constructed and arranged as and for the purposes herein set forth.

2d, The combination of said duster, or apron, with the bridge or crossing, B, in the manner and for the purpose herein described.

71,559.—CAR COUPLING.—W. Y. Warner, Wilmington, Del.

I claim the link, F, balanced or nearly balanced by the chain, B, or its equivalent, and arranged to slide on the coupling bolt, E, all substantially as set forth.

71,560.—PLOW.—George Watt, Richmond, Va.

I claim, 1st, A plow frame or casting, A, having a neck or breast, a, constructed substantially as herein described, and serving to prevent the accumulation of trash, etc., between the cutting edge and the beam.

2d, The brace rod, J, reflexed at both ends, as described and employed, in conjunction with the staples, j' b1, and key, b2, to connect the frame, A, and mold board, B, substantially as set forth.

3d, The combination with the slide or land side bar, D, of the hook-shaped projection, d, staple, d1, key, d2, and notches, a5, for adjustably securing said slide to the frame, A, as set forth.

4th, The combination, with the frame or casting, A, of the handles, G G, when attached by the bolts, g g', substantially as described.

5th, The removable extension piece, F, applied substantially as and for the purpose set forth.

71,561.—VELOCIPEDE.—Charles A. Way, Charlestown, N. H.

I claim, 1st, The arrangement of the cranks, d, and short axles, c, with reference to each other and with the seat, e, side rails, b, and supporting wheels, B, substantially as and for the purpose specified.

2d, The cords, s, crossing each other, and arranged to operate the gliding caster, g, substantially as and for the purpose specified.

3d, The center rails, a, arranged with their forward portions lower than the corresponding parts of the side rails, b, substantially as and for the purpose specified.

4th, The arrangement of the braces, f, in relation with the side rails, b, and center rail, a, substantially as and for the purpose specified.

71,562.—VELOCIPEDE.—Charles A. Way, Charlestown, N. H.

I claim, 1st, The two driving wheels, furnished with the crank wrists or handles, arranged in relation with the main frame and seat, substantially as and for the purpose specified.

2d, The lever, r, bar, in, and cords, f, arranged in relation with each other and with the arms, e, of the arbor of the caster wheel, substantially as and for the purpose specified.

71,563.—SPRING SEAT FOR CARRIAGE.—John Werntz, Bourbon, Ind.

I claim, 1st, The springs, B C, in combination with the blocks, D, cross bars, E E, and bolt, c, as and for the purpose explained.

2d, The springs, B C, blocks, D, cross bars, E E, and bolt, e, in combination with seat, A, and sockets, a, in the manner and for the purpose described.

3d, The springs, C, with piece, c, in combination with cross piece, F, with socket, f, step, f', and bar, f'', substantially as described.

4th, The springs, B C, blocks, D, cross bars, E E, bolt, e, seat, A, sockets, a, cross pieces, F F, and hooks, G, when combined and arranged substantially as set forth.

71,564.—TELEGRAPH INSULATOR.—Merritt L. Wood, Ithaca, N. Y., assignor to himself, Samuel Porter, and L. M. Monroe.

I claim, in combination with the conical-shaped iron insulator, A, the wedge B, inserted in the top of the standard or support, in the manner and for the purpose as set forth.

Also, the groove, N, around the standard, F, for holding paraffine or other suitable material, for the purpose set forth.

71,565.—TEA POT.—Douglas B. Woodworth, Cincinnati, O.

I claim a fusible metal pot body, A, having the shallow pit or depression, B, and an annular foot, D, of non-fusible metal, brazed or soldered within the receding angle, C, of the pit, at or near the plane of the latter, and wholly external to said body, as and for the purpose set forth.

REISSUES.

2,805.—COMPOSITION FOR INKING ROLLERS, PADS, AND OTHER PRINTING PURPOSES.—Lewis Francis, and Cyrus H. Loutrel (assignees of Lewis Francis and Frederick W. Letmate), New York city.

We claim a composition, made substantially as described, for printing purposes.

2,806.—WATER BOILER.—Charles A. Harper, Rahway, N. J.

I claim, in combination with a boiler, A, an annular water chamber, C, connected therewith by pipes, D D', and so constructed and arranged that the heat shall be applied entirely around the latter, and the water circulate through the same, substantially in the manner set forth.

3,807.—BOOT AND SHOE.—Gilbert Hawkes, Lynn, Mass.

I claim, 1st, An inner sole, made of a textile material, to be used either with or without a stiffening substance, as set forth.

2d, A strip, B, of a textile or other suitable material, or its equivalent, when used as and for the purpose described.

3d, The combination of an inner sole, A, formed of a textile material, with a strap, B, of any suitable material, as and for the purpose specified.

4th, The application to the lasting of boots and shoes, of an inner sole, of textile material, as described.

5th, The mode, substantially as set forth, of securing the uppers to the inner sole, in lasting boots or shoes, by stitching the former, not directly to the latter, but to a suitable supplementary material attached thereto.

DESIGNS.

2,837.—COOK STOVE.—John B. Crowley (assignor to Chamberlain & Company), Cincinnati, Ohio.

2,838.—DOOR KNOB.—Jacob Euteneur, Peoria, Ill.

2,839.—STOVE PLATE.—Henry S. Hubbell, and Alfred S. Hubbell, Buffalo, N. Y.

2,840.—JAR.—S. B. Rowley, Philadelphia, Pa.

2,841.—MUFF.—R. M. Seldis, New York city.

2,842.—TRADE MARK.—D. O'Sullivan, Leicester, Mass.

2,843.—SKATE RUNNER.—H. P. Tilden, Philadelphia, Pa.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., 37 *Park Row, N. Y.*

66,861.—LAND ROLLER AND MARKER.—A. Mains, Olena, Ill. Dated July 16, 1867. Application for reissue received and filed Nov. 1, 1867.

1st, I claim the frame, a b b and d, in combination with the roller, Q, seat, Y, and tongue, E, constructed and arranged as described and for the purpose set forth.

2d, The levers, T, pivoted to the side of the frame, a b b and d, in combination with the guard, M, and button, Z, constructed and arranged as described and for the purpose set forth.

3d, The semicircular rings, S S, constructed and arranged as described, in connection with the foregoing claims, for the purpose of a ground marker.

4th, The scraper, K, constructed and attached as described and for the purpose set forth.

68,271.—STRAWBERRY TRELLIS.—Wm. W. Wilcox, Middletown, Conn. Dated Aug. 27, 1867. Application for reissue received and filed Nov. 14, 1867.

I claim a trellis, a, made substantially as described, with an upright post or posts, e, and branching arms, c, or their equivalent.

40,226.—LAMP.—Lewis J. Atwood, Waterbury, Conn., assignee by mesne assignments of himself. Dated Oct. 13, 1863. Application for reissue received and filed Nov. 16, 1867.

1st, I claim a draft plate deriving its support from the burner, in combination with a chimney holder below the edges of that draft plate, substantially as set forth, so that the light can shine through the transparent chimney both above and below said draft plate, as specified.

2d, An opening or series of openings between the said draft plate and the interior of the chimney to allow an auxiliary draft to pass to the flame, substantially as set forth.

3d, In combination with said draft plate deriving its support from the burner and the chimney holder below the edges of said draft plate, I claim a perforated air distributor applied substantially as and for the purposes set forth.

4th, The combination of the aforesaid draft plate, chimney holder, and perforated air distributor, with a hinge connecting such chimney holder to the burner, substantially as and for the purposes set forth.

5th, Connecting the said draft plate to the burner by a slide, so that it may be adjusted in position, or removed, substantially as and for the purposes set forth.

68,814.—WATCH.—N. B. Wallace, Fond du Lac, Wis. Dated Sept. 10, 1867. Application for reissue received and filed Nov. 18, 1867.

I claim the two-part cup, F, for the winding post or other axis of a watch movement, substantially as and for the purpose described.

61,986.—MUSKETO BARS FOR WINDOWS, ETC.—Volney Barker, Otisfield, Me. Dated Feb. 12, 1867. Application for reissue received and filed Nov. 20, 1867.

I claim the sockets or corner pieces of a frame, made of metal or other suitable material, substantially as and for the purpose described.

I also claim in combination with the above, the bars, C, provided with grooves for the reception of tongues, w, substantially as and for the purpose set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application to* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

EXTENSION NOTICES.

John B. Holmes, of New York city, having petitioned for the extension of a patent granted to him the 21st day of February, 1854, for an improvement in derricks, for seven years from the expiration of said patent, which takes place on the 21st day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 3d day of February next.

L. Otto P. Meyer, of Newtown, Conn., having petitioned for the extension of a patent granted to him the 28th day of February, 1854, for an improvement in vulcanizing india rubber and other gums, for seven years from the expiration of said patent, which takes place on the 28th day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 10th day of February next.

Sidney S. Turner, of Westboro, Mass., having petitioned for the extension of a patent granted to him the 23d day of August, 1854, and reissued the 25th day of March, 1856, and again reissued the 16th day of May, 1865, for an improvement in sewing machines, for seven years from the expiraton of said patent, which takes place on the 22d day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of June next.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,705.—COMBINED TUCK CREASER AND SELF-GUIDE OR BASTER, FOR SEWING MACHINES.—Henry W. Fuller and Isaac W. Barnum, New York city. Sept. 25, 1867.

2,850.—DEVICE FOR BUNGING BARRELS OR CASKS.—John Ruigg and Joseph G. Marriott, St. Louis, Mo. Oct. 10, 1867.

2,887.—MACHINERY FOR LOADING HEAVY ORDNANCE.—James B. Eads, St. Louis, Mo. Oct. 14, 1867.

2,888.—REVOLVING BATTERY.—James B. Eads, St. Louis, Mo. Oct. 14, 1867.

2,913.—GOVERNOR FOR STEAM AND OTHER ENGINES.—Reuben K. Huntoon Boston, Mass. Oct. 17, 1867.

2,915.—CHAIR FOR THE USE OF DENTISTS, BARBERS, PHOTOGRAPHERS, ETC.—Otis C. White, Mass. Oct. 17, 1867.

IMPORTANT PATENT CASE.

WOOD AND STRAW PAPER.

Watt & Burgess obtained English Letters Patent, Aug. 19, 1853, for an improved process for making paper from wood by boiling in caustic alkali under pressure. This patent was assigned to Ladd & Keen and by them reissued in two divisions in 1863. Meillier obtained a French patent for making paper from straw by boiling it in caustic alkali under a pressure of seventy pounds. Morris L. Keen obtained two patents for improved boilers for pulping wood and straw. In 1863 the American Wood Paper Company was organized with a capital of $1,000,000, and the Hon. Thos. A. Jenckes, of Rhode Island, as President. This company purchased all these patents and erected extensive works near Philadelphia.

John W. Dixon, of Philadelphia, in 1863, invented an improved process of treating wood and straw to make paper, and an improved boiler for treating these materials. J.D. Heft & Co., at Philadelphia; General Markle, at Pittsburg; the Philadelphia Inquirer Paper Mills, and other large mills, introduced the Dixon apparatus and process.

The American Wood Pulp Company promptly instituted suit against the uses of the Dixon process and apparatus, under all four patents owned by them. The case was argued in final hearing upon an unusual mass of testimony and exhibits, by Hon. Thomas A. Jenckes, of Rhode Island, for the plaintiff, and George Harding, Esq., for the defendant. The bill was finally dismissed, and the injunction asked for refused.

The main points in the case were set forth in the condensed opinion of Mr. Justice Grier, of the Supreme Court of the United States, as follows:

1. That the reissued Watt & Burgess patents of 1863 are illegal and void requires no further reasons than those alleged in the answer, and clearly substantiated by the evidence.

2. Meillier's patent is intended for straw alone.

He was not the first to succeed in this enterprise. His patent must be construed by taking a view of all its parts. He says his invention consists in subjecting straw to a pressure of at least seventy pounds to the square inch—prefers eighty. "I have found by experiments that it is essential that a temperature equivalent to seventy pounds must be employed." The only practical method of determining the temperature of the liquid is by noting the pressure on the boiler.—Testimony of Burgess. Accordingly the patentee describes 70 pounds as synonymous with 310 deg. Fahrenheit. Again, he describes it at 70 to 84 pounds: the claim uses the term not less than 310 Fahrenheit, which he has before defined by 70 pounds to the square inch. The claim of this patent was sustained only against those who went beyond 70 pounds in New York. The process used by defendants does not come up to the minimum claimed by Meillier. The defendant's do not use over 60 pounds to the square inch. There is no proof that defendants infringe either of Keen's boiler patents, either of 1859 or 1863. Keen's patent of 1859 is for a combination of devices which is not used by defendants. His patent of 1863 claims a perforated diaphragm of which he was not the inventor. Nor was he the first to use a discharge pipe and valve for the purpose of blowing out or discharging the contents of the boiler under pressure. The arrangement of a discharge-pipe with stop-cock is what every one using a vertical boiler might use without invention, and is not open to be monopolized by Keen.

The combination of devices in defendant Dixon's Patent has more claim to originality and invention than, and does not infringe, either of Keen's patents.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The clock and watch trade of France, is officially represented as amounting to 35,000,000 francs annually.

Grass valley, in California, is pronounced by Commissioner Brown, the most productive gold quartz mining district in the world. The annual yield of an area drawn by a radius of four miles, is $3,500,000.

The advantage of introducing improved or labor saving machinery is conclusively shown by this fact in the boot and shoe manufacture in this country. In 1860, 123,029 persons produced 70 per cent more than 100,866 persons produced ten years previous, in 1850; or, each person produced 50 per cent more.

At a late meeting of the Lyceum of Natural History of this city, Prof. Chandler exhibited a sample of more than one hundred ounces of native platinum ore from Oregon. Small quantities of valuable ore have from time to time found their way to this city, but this is by far the largest amount ever yet received.

The English cabinet after long consideration of the subject have resolved to place all the telegraph lines of Great Britain under the direction of the Post-Office Department.

Evan's Pass, the highest point between the Atlantic and Pacific oceans—elevation 8,242 feet above tide level—will be reached by the Union Pacific railroad in January. Work on the rock cuttings on the western slope will continue during the winter so that track-laying may be resumed early in the Spring.

There is now a continuous railway communication between Chicago and St. Paul, Minn., a distance of 392 miles.

White ants have proved so destructive to the wooden sleepers of East India railways that government some time since offered a reward of £50 for the discovery of any means for putting an effectual stop upon their ravages. It would naturally be expected that the jarring of the sleepers whenever trains passed them, would of itself drive them from the wood, but the contrary is the case. The timbers have been boiled in poisonous liquids; and have been coal-tarred, but neither operation had the desired effect. In response to the government offer, many plans were presented but the successful competitor has recommended "teak oil." It has been shown that timber coated with this specific, remained untouched after lying for a long time even in the very nests of the white ants.

Illuminating gas is made from Cannel and other foreign coals, the United States with all its immense coal fields, furnishing heretofore no good substitute therefor. From Cameron county, Pa. a new variety of "black diamonds" has recently been brought to market which it is said, has proven itself to possess all the qualities necessary to render it a superior gas coal and render us independent of the imported article. Such a result is sincerely to be desired by every gas consumer, as a reduction in the price would then be brought about.

We have already noted the proposed ship canal across the peninsular of Florida from the Mexican Gulf to the ocean, and now add on the authority of the Fernandina *Courier*, that operations, on this enterprise will be commenced immediately by the Florida and Inland Transportation company the necessary funds for the prosecution and early completion of the undertaking, having been raised in that city and the work having been put under contract. A railroad through the peninsular to Cape Sable, is one other improvement which is called for by the Southern journals. From this point a ferry across to Cuba would not exceed one hundred miles, and the distance from land to land might possibly be reduced to about the distance between Dover and Boulogne. The completion of this road would bring Havana and New York within a hundred miles of each other.

Application has been, or is about to be made in the Parliament of Ontario, for a charter for a new railroad between Buffalo and Detroit, on a nearly direct route skirting the North shore of Lake Erie. The distance by the Great Western road between suspension Bridge and Detroit is 224 miles, and from Buffalo to Suspension Bridge 24 miles. The proposed line would be thirty miles shorter than by the Great Western.

The Essen establishment of Krupp's which has existed forty years, now employs 10,000 workmen. Last year 62,500 tuns of cast steel, valued at $7,500,000 left the works. Essen has now delivered 3,500 cast steel guns valued at $5,250,000. The manufacture of the steel production of last year involved a daily consumption of one thousand tuns of coal.

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

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Vol. XVII.—No. 25. [NEW SERIES.]

NEW YORK, DECEMBER 21, 1867.

$3 per Annum [IN ADVANCE.]

Improved Safety Generator and Portable Engine.

Fig. 1 of the accompanying engravings represent the Wilcox portable steam engine and safety steam generator combined. The engine is placed horizontally on the side of the generator. The cylinder, bed piece, slides, and main bearing are cast in one piece, and therefore cannot get out of line by displacement or the working strain upon the parts, and are not subject to unequal contraction and expansion either by the heat of the boiler or of the cylinder; indeed, the generator is so constructed, as will be presently described, that there is little heat given off from the exterior. The cylinder has a cast-iron polished jacket, the crank is balanced, the material is excellent, and the workmanship—as was evident to all who examined the engine exhibited at the late Fair of the American Institute—of the very best description. The connection of the governor with the inlet pipe is direct, and the pipe itself as short as possible, and of ample diameter; thus the steam is never cramped and the quantity admitted to the cylinder is under perfect control. The pump and fly wheel are placed on the side opposite the cylinder, the shaft crossing the back end of the generator. On the front are seen the steam gage, water gage, damper handle, etc. The whole arrangement is neat, compact, and serviceable.

Fig. 1

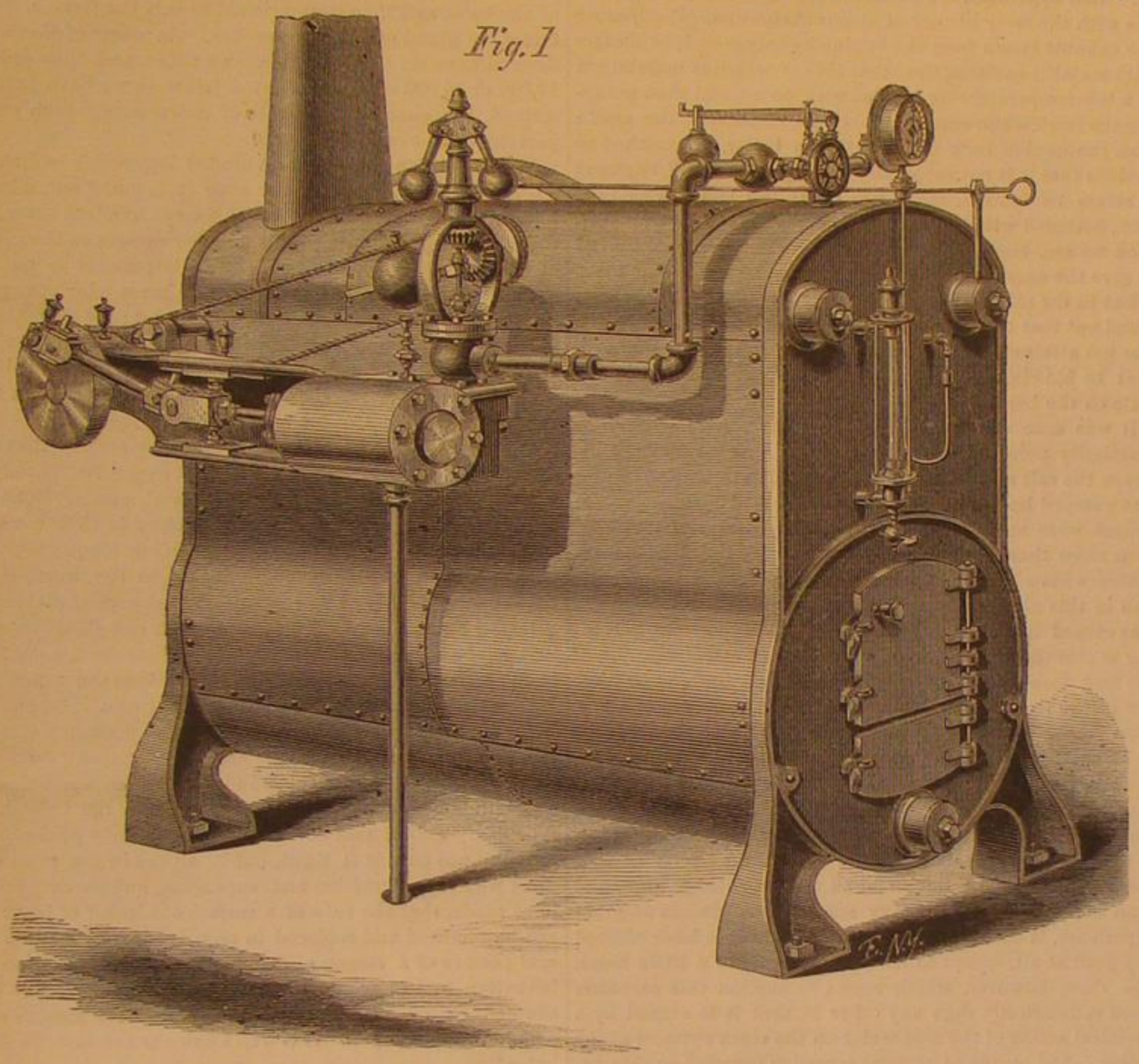
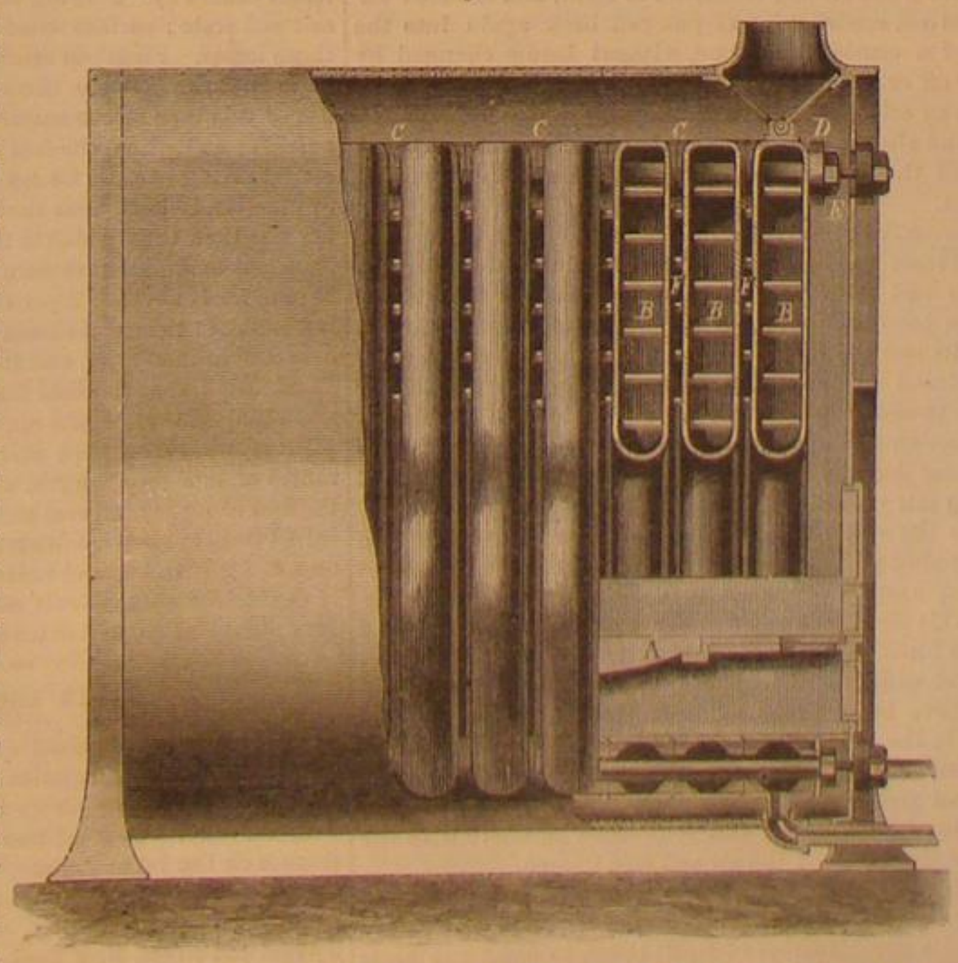


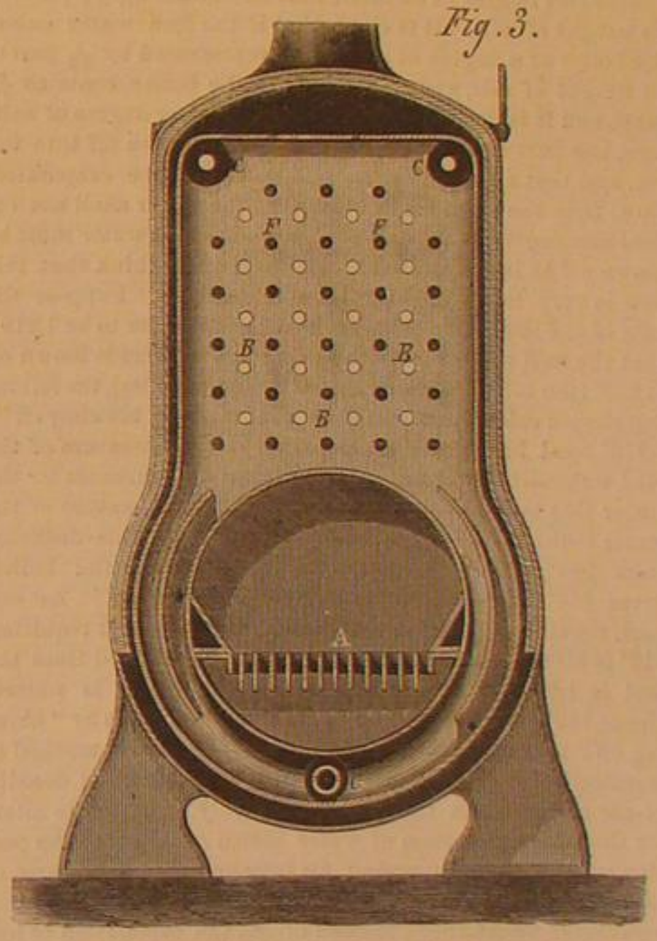
Fig. 2



Figs. 2, 3, and 4 present different views of the generator, of which Fig. 1 is a perspective representation, which, however, is a small one, intended for a portable engine of from three to ten horse-power. Fig. 2 is a semi-sectional view of a portion of the generator. As will be seen, the generator is constructed in sections, one of them being shown very perfectly in Fig. 4. These sections are of cast iron, forming hollow chambers, which are fitted and bolted together to any required number. The lower portion is a ring which surrounds the grate, forming the furnace and ash pit, the grate being seen at A Figs. 2 and 3. The form of the fire box and ash pit is seen in the end section, Fig. 3. Tho upper portion of these sections is the steam chamber, or steam and water space. The flat sides of these chambers are stayed by numerous studs, cast in, which are represented at B, Fig. 2, and by the white circles in Fig. 3. There are three openings in each section surrounded by circular flanges, C, and by these openings each section communicates with those adjacent. These flanges are milled off to form the joints, each alternate one having a slight lip that fits in a corresponding recess in the next. The sections are then brought together and secured by means of a stout bolt passing through each of the apertures, C, upon which is placed a cap, D, and nut, E, Fig. 2. The sections are held by the milled flanges sufficiently far apart to allow the flame and gases to pass between their respective sides. The stays, B, are made with an excess of strength over the flat surfaces they support, so that when dangerous pressure occurs a small hole will be formed by the giving way of the metal between the stays before the stays themselves will part, and a disastrous explosion be thereby prevented.

There are curved partitions within the ring portion as shown in Fig. 4, for the purpose of aiding the circulation of the water. The column of water next the furnace is being constantly converted into mingled steam and water which being lighter than the solid columns of water on the opposite side of the partition, the difference in gravity induces rapid circulation, by which the steam is swept from the heating surface as fast as generated and fresh water is as constantly

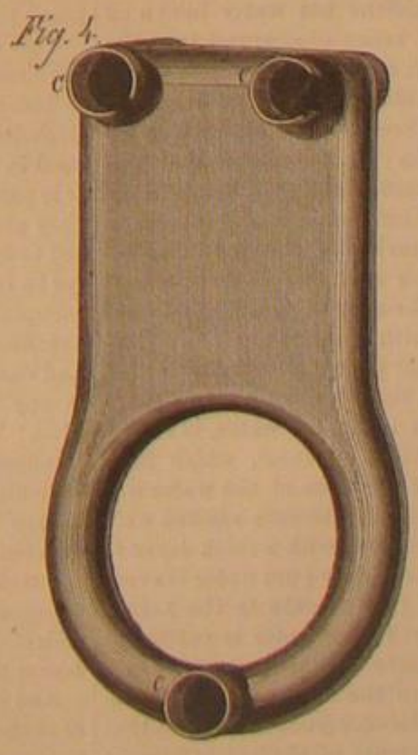
Fig. 3.



brought in contact with the heated sides of the surface, the steam being carried to the chamber above, where it separates from the water and rises into the steam space, while the solid water returns to the other side of the partition, carrying with it the sediment, which settles in the quiet space below the grate, and may be blown out through a cock on the back end of the generator.

The same bolts that hold the sections together extend through the cast-iron ends and support the whole structure. The sides, top, and bottom of the generator—in fact the whole space between the cast-iron ends—is covered with a sheet-metal jacket made double and filled with plaster of Paris or some other non conductor, which prevents loss of heat by radiation.

Fig. 4.



Boilers constructed in sections have within a few years attained a great popularity, and this is not strange when it is considered that when the large mass of water and steam finds vent through the shell of a boiler, its sudden liberation spreads destruction around. If a hole of a few inches in area is made, the steam and water escape only gradually and without doing serious harm. It is impossible, probably, to prevent the giving out of boilers through carelessness or ignorance; the remedy appears to be to so construct the boiler that when any part fails, only a portion can give out at a time. This object may be attained by building the boiler in sections, so that if one fails the others are left intact and their contents liberated gradually by escaping through the small openings communicating with the ruptured section. The sections, however, of this generator are of such great strength that they can be burst only by the grossest stupidity. They

THE WILCOX COMBINED STEAM GENERATOR AND ENGINE.

are tested to a pressure of from 400 to 500 pounds per square inch before being combined, even when the working pressure required is from 60 to 100 pounds only.

In small boilers there is not always sufficient steam and water capacity in proportion to the work demanded, and in case of a heavy load being thrown upon the engine or fresh fuel put upon the fire there will be fluctuations in the water level, the steam pressure inducing foaming and demanding constant care and the most skillful management.

This generator is so proportioned as to be free from the above objections, and is very economical in fuel and perfectly safe from danger of explosion. For further information apply to the Wilcox Caloric and Steam Engine Company, Providence, R. I.

SURFACE CONDENSATION FOR MARINE ENGINES.—THE LOSS BY "BLOWING OFF."

The subject of the surface *vs.* the jet condenser is a constant theme with engineers, and although we do not by any means desire to pronounce against the employment of surface condensers in sea-going steamers, we think the economy attainable from their use is to a considerable extent overrated. In order to appreciate this, let us in the first place look at the possible theoretical gain attainable by the use of a surface condenser (irrespective of the cost of the apparatus and the expense of its maintenance), and then examine the drawbacks attending its employment.

The water of the ocean contains on an average $\frac{1}{32}$ part of its weight of salt, and it is a common practice with sea-going engineers to carry the water in the boilers at about double this degree of saltness, that is, containing $\frac{2}{32}$ parts of its weight of salt. It is clear that if the feed water enters the boiler at a degree of saturation represented by $\frac{1}{32}$ part of its weight of salt, and the water in the boiler contains $\frac{2}{32}$ parts, and it is desired to keep it at the latter degree of saltness, one part of the feed water must be blown off into the sea, and that an equal part will remain to be evaporated. Now, from the fact that in order that the water shall not exceed this degree of saltness ($\frac{2}{32}$), as much feed water must be blown off as is evaporated into steam, many think that this loss is very much greater than it really is. Suppose the sum of the latent and sensible heat in the steam to be 1,210°, that the feed water enters the boiler at 110°, and is blown off at 230° (the temperature of the water in the boiler), the following simple calculation will show the loss by "blowing off"; 1,210° total heat in the steam—120° the temperature of the feed water—1,090° heat required from the furnaces for the water that is to be evaporated. Now the temperature of the water blown off from the boiler is 120°, and this deducted from 230°, the temperature of the water in the boiler, gives 110°, the loss of heat by "blowing off." As one part, requiring 1,090° is evaporated, and one part requiring 110° is blown into the sea, the total heat utilized from the fuel is 1,090°+110°=1,200°; and of this 110° is wasted. Hence 110°×100÷1,200°=9.16, the per cent of loss by "blowing off" to maintain the saturation at $\frac{2}{32}$. This method of calculation is of course applicable to any degree of density of the salt water in the boiler; it is only necessary to allow for the ratio the portion of water blown off bears to the portion evaporated. Supposing, for instance, that the degree of saturation of the water in the boiler was $\frac{3}{32}$ (a saturation sometimes maintained), instead of $\frac{2}{32}$, the calculation of loss would be as follows, bearing in mind that in this case *two* parts of the water pumped into the boiler are converted into steam, while but *one* part is blown overboard. Therefore 1,090°×2=2,180°, is the heat required from the furnaces for water that is converted into steam; and hence, 110° (temperature of the one part blown off) ×100÷2,180=5.04 per cent, the loss by "blowing off" to maintain the saturation at $\frac{3}{32}$. And the same method of calculation may be used to ascertain the economy of using a heater to raise the temperature of the feed water, by passing it around or through a series of tubes, on the other side of which the hot water blown off from the boiler circulates, before being discharged into the sea. But it should be pointed out that it will not give a true result to calculate the loss by "blowing off," first with the heater and then without it, and then to call the difference between these two amounts the gain; for the reason that this method does not bring the important element of the heat imparted to that portion of the water which is converted into steam into the calculation, the saving is the difference between the heat required from the fuel to boil off that portion of the water which makes the steam. Thus, if without a heater 1,250° is required, and with a heater but 1,150°, the gain will be 1150°×100÷1,250=8 per cent.

It need scarcely be stated that the object of blowing off a portion of the water from boilers using sea water, is to prevent the deposit of salt and other substances, which form scale on the heating surfaces. If a portion of the water was not blown off, the boiler would speedily become choked with salt, and the heating surfaces incrusted with a thick layer of hard, non-conducting scale; because only pure water is evaporated, and the solid substances in it remain in the boiler. It will be readily perceived that if the water is carried at such a degree of saltness as to cause the surfaces, which conduct the heat of the furnaces to the water, to become incrusted with a non-conducting substance (such as scale is), that not only will the evaporative efficiency of the boiler become less and less, as the deposition of scale increases, but the incrustation may become of such a thickness, on certain parts, as to almost prevent the heat of the fires from being transmitted to the water; as a consequence of this condition, those portions which are exposed to the highest temperature from the furnaces—particularly the crown sheets—are liable to be made red hot, and to be bulged in and ruptured, allowing the scalding water and steam to escape over the fires. This being the case, if the engineer stints the quantity of water blown off, although at first he will be able to carry more steam and burn less coal, it will not be long before he will find that "she does not steam as well as she did," and the coal pile is being reduced more rapidly; hence it is far better to submit to the constant, but not increasing loss of a liberal "blowing off," than by stinting it to make a little more steam at first, in a short time to be followed by such a degree of incrustation as not only to far more than neutralize the economy attainable at the start, but also to incur a great amount of labor in picking off the hard scale, when the vessel arrives in port, as well as to shorten the life of the boilers by the overheating, and the incessant chipping of the scaling hammers.

With this state of affairs staring them in the face, it is not surprising that marine engineers have for a great many years given great attention to the method of condensation which, theoretically, returns pure fresh water to the boilers, and thus saves not only the loss of "blowing off," but also prevents the deposition of scale, and consequently keeps the heating surfaces in contact with the water in the highest state of efficiency. This apparatus, the Surface Condenser, is contemporaneous with the early history of steam navigation. Condensing the exhaust steam from the engine by bringing it in contact with metallic surfaces, the other side of which is maintained at a low temperature by contact with water, and then pumping the fresh water made by this condensation of the steam from the engine back again into the boiler, is a method so obvious that it is not surprising that our forefathers, engaged in steam navigation, made use of it; the more so as they were bothered with scale from the outset, much more, in fact, than we are, because their boilers were but poorly contrived to give the easy access necessary for the use of scaling tools.

But in the early history of surface condensation it was soon found out that the theoretical gain expected to attend its use was not attainable, either as regards stopping the waste of heat by blowing off, or wholly preventing the formation of scale on the heating surfaces.

It was soon established that if the surface condenser was practically perfect—that is, that there was no leakage between the salt and fresh water compartments, and salt water was pumped back into the boilers by the feed pump—that the boilers were speedily corroded or eaten away, and injured even more than by the effects of incrustation. Various hypotheses have been from time to time advanced in explanation of this phenomenon. Among others, that the corrosion was caused by galvanic action; the voltaic current, according to this theory, produced by the contact and circulation of the feed water about the brass of the condenser and the copper of the feed pipes. No sooner had this view of the case been generally talked about among engineers, than copper or brass feed pipes were suppressed, and cast iron substituted; besides, the tubes, and indeed every part of the condenser made of brass which came in contact with the feed water, were covered with tin. So if copper and brass had any thing to do with corrosion, it clearly would stop as soon as that cause was removed. But as far as our knowledge goes, and from conversation with many sea-going engineers of great experience, it does not seem that these changes have effected any good at all, except to save the expense of a little brass. The view, however, which seems to explain this corrosion more satisfactorily than any other is, that it is caused by a chemical action of the feed water on the clean surfaces of the boiler. And means to prevent corrosion founded on this explanation, appear to have been uniformly followed by very satisfactory results. It seems to be pretty conclusively established that if the surface condenser is tight, and the feed water boiled off, condensed, and pumped back again into the boiler for a considerable time, without being changed by blowing off or mixing it with sea water, that the feed water acquires an acid and corrosive property which attacks the seams, and also selects places in the middle of sheets to eat into, until the iron often looks as though it had had the small pox.

This corrosive property of the feed water, so it is stated, is acquired from the decomposition of the lubricants used in cylinders and steam chests, more particularly the tallow, doubtless increased from the sulphuric acid almost always used in its rectification. The means to prevent corrosion, if it is produced by this cause, at once suggest themselves; they are twofold; first, a thin layer of scale must be permitted to form on the interior surfaces of the boilers, and the water in them must be frequently changed, by blowing off and pumping salt water into them. The layer of scale of course prevents the water from coming in contact with the iron, and changing the water cleans it of the corrosive properties it may have acquired by continually passing through the engine. This method is now the usual practice with sea-going steamers fitted with surface condensers, and we believe the difficulties which not long since bid fair to put a damper on its use have been wholly removed. Again, the tallow and oil used in the cylinders is carried over into the condenser by the steam, and sometimes to such an extent as to choke the tubes, and frequently to form hard balls, or pellets, which collect in the condenser and sometimes interfere with the action of the valves of the air and feed pumps.

And this fact leads us to a consideration of the construction of surface condensers. The condensing surfaces almost always consist of a great number of small tubes, by some engineers made ⅝ of an inch outside diameter, and seldom if ever over 1 inch; now the great end to be attained in the construction of this species of condenser, is to secure these tubes in the tube heads, so that the joints will be tight, and at the same time to allow the tubes to slip back and forth through the joint as their lengths are altered by the varying temperatures within the condenser; further, these joints must be made so that the tubes may be easily and quickly withdrawn, either to clean them from the impurities already alluded to carried over by the steam, or to replace a defective one. Simple as these conditions may appear at first sight, the fact that there is scarcely a point about the marine steam engine which has received so much attention from engineers as this one, and has been the subject of so many patents, shows that it has not by any means been an easy problem to solve. The expense of some of these plans is so great as to almost preclude their use in ships designed for commercial purposes. For instance, in the patent adopted by Mr. Isherwood for the navy, each joint is made in the thick brass tube heads as follows:—first, a hole, a loose fit for the tube, is bored through the head, then this hole is counterbored about half way through, thus forming part of a stuffing box; into this larger hole a rubber ring is inserted, surrounding the ends of the tubes, which projects a short distance beyond the head; a polished brass ferrule, or ring, is then inserted around the tube, and rests on the rubber ring, on which it is pressed by a composition follower, which is large enough to perform the same duty for a great number of tubes. This follower is bored similar to the tube head, that is, first with holes the size of of the tube, and then counterbored to suit the ferrule, which forms the gland of the stuffing box. As many of these condensers have six or seven thousand tubes, and thus require 12,000 or 14,000 such complicated joints as we have just described, the enormous expense of constructing such an apparatus will be easily perceived.

With this plan not only is it almost impossible to discover a leaky or defective tube, but after it is found out, a heavy follower, which makes the joint of several hundred tubes, has to be removed. Again, as this follower presses on the glands of so many stuffing boxes, it is quite impossible to put the exact pressure on each of these stuffing boxes which the packing in them requires to make a perfect joint; the consequence is that a considerable number of the tubes are either so tightly packed that they cannot contract or expand without bending, or they are so loosely packed that the joints leak from the salt to the fresh water side of the condenser.

For these and other reasons it is pretty certain that this surface condenser is not only the most expensive, but at the same time the most inefficient introduced, and yet hundreds of thousands of dollars have been wasted in their construction in the U. S. Navy during the last five or six years.

Now that we have directed attention to the worst closed surface condenser we know of, we will take great pleasure in pointing out the most efficient, and at the same time the most inexpensive one yet introduced. The tubes are the same as in the former one, but they are secured into the heads in a very different manner. The heads are of cast iron, and the holes for the tubes are bored of a uniform diameter straight through them, about twice the area of the tubes. In the annular space between the tubes and these holes, a soft pine cylinder (in length about twice the thickness of the tube head) is driven. This simple device forms a positively perfect joint, because not only is it tight, but it allows in the most complete way for contraction and expansion, and so easy is this joint made, that the tube of a surface condenser of large size can be removed and replaced in one day by the firemen and coal passers of a steamer. This condenser is an American invention, and so complete is it regarded that it has been adopted extensively by the most conservative marine engineers in Great Britain. It is well known as the Horatio Allen patent.

To retrace our steps a little, we will direct attention to the fact that in the first part of this article we pointed out the losses caused by "blowing off," to prevent the deposition of salt and scale; surface condensation is intended to prevent those losses. From our remarks on this point it seems pretty plain that the possible theoretical saving attainable by the use of this type of condenser, is not over 12 per cent at the outside; and when the fact is borne in mind that this theoretical saving cannot, for reasons already shown, be obtained in practice, it is obvious that the actual saving is considerably less than that which is theoretically calculated. Experience and observation sustain the conclusion that the saving in practice is not over 8 per cent., and when against this saving is placed the great excess in original cost of this condenser over the ordinary jet, and its greater complication, it must be admitted that the field for the surface condenser is much more limited than would appear at first sight.

From what has been stated, it is obvious that for ocean routes of moderate length, when the accounts are squared at the end of a year, no real economy will be found to have resulted from surface condensation. For instance, to employ it on a Long Island Sound route, although the steamers scarcely ever leave water as salt as the ocean, is, to say the least, very short-sighted and extravagant engineering.

SOME USEFUL HINTS.

Doctor Hall in his most excellent monthly for December states his views and experience on many utilitarian subjects in his unique way which we transfer to these columns.

By the way, a new volume of the *Journal of Health* commences on the 1st of January and we would recommend it as a most useful and entertaining family magazine. Price $1.50 a year, published monthly. Address W. W. Hall, M. D. No. 2 West 43d street, New York.

Driving Nails.—Within a year we have seen it stated, as a new truth, that if a nail were wetted in the mouth and if, in addition, the narrow edge was placed with the grain of the wood, it would seldom split the board into which it was driven. We well remember to have seen our father do this as far back as in eighteen hundred and eighteen. But errors and truth are alike exhumed from the grave of the past in mechanics

medicine and theology, and even in so-called "science" itself; the best remedy under the circumstances is for each man to be for himself "wary" of what is new, look into everything proposed with a patient, close and critical eye, and never give up old things too readily; for in very many cases, our fathers were wiser in their generations than we sometimes give them credit for.

ANIMAL GRAFTING.—Mr. Best, a French naturalist, cut on a rat's tail and joined it on to the freshly cut tail of another rat; the parts grew together and waggled like any other tail; in four months it was found that all the proper vessels, veins, arteries, and nerves were supplied. Dr. Allen, of Bond street, narrates that a tooth freshly drawn from a negro boy was inserted into the socket from which his mistress had a "snag" taken, and it grew firm and did her good service for many years. It was considered at that time, that as the boy belonged to the mistress, so did his tooth and that hence the exchange was no robbery.

But the tables, later on, were turned against the white man. The owner of a plantation had a faithful and most truthful old negro, to whom he committed the fattening of a turkey for a Christmas dinner; but on Christmas morning the turkey was no where to be found; some of the other "hands," on being questioned, gave the information, that the faithful old servant had killed the turkey the night before and made a good supper of it himself. The master was surprised and greatly grieved; and summoning the old man to his presence, he acknowledged that he had killed and eaten the turkey. But, said the master, don't you think it wrong to steal from me that way, making use of my property? Why no, massa, that's no stealing. I'm your property and the turkey is in me, and we bofe belong to you as before, only turkey has changed places, and instead of being in the coop, he is in a safer place, in my stomach, and we bofe are yours, turkey and negro too and you have as much as you had before, so I done no wrong." The logic puzzled the master, and he let Sambo off.

FLESH UNITING.—It is a common surgical operation to supply a new nose or ear or part of the face or lips from the arm, letting them grow together, then cut the arm loose, and manipulate the flesh into the proper shape.

An iron gate slammed to, while my neighbor's child was holding to the stationary upright; the mother saw it from her window, and running to her child she found the fleshy part of the end of the thumb cut off; with great presence of mind she pressed the severed pieces together: they united firmly. Our readers may make a practical use of these facts in many of the accidents of life; after all, these are the application of a principle of a common cut or gash, for if instantly the sides are pressed together and are kept together, the healing process goes on with great rapidity, leaving only a scar.

HAIR REMOVED.—Persons are sometimes annoyed by hairs growing in unsightly places, which may be removed. Thus, take sixty grains of quicklime, forty grains of yellow sulphate of arsenic and sixty grains of powdered starch, make it into a paste with water, apply it to the spot from which it is desired to remove the hair, and in a few minutes it is done.

[But Doctor what is the effect on the skin of the patient?]

FROSTY WEATHER.—Few have failed to observe what a vigor and elasticity are imparted to both mind and body by a frosty atmosphere, and what a loss of all these there is in a hot summer day; this is probably owing to the fact that at noon of any clear frosty day in winter, there is ten times as much elasticity in the air as there is at any noon of summer; hence to all invalids, the days most valuable for exercise are those of frosty weather, and those least beneficial are where it is warm or thundery; hence every hour of daylight spent in the open air in frosty weather in some kind of out-door activities is that much gain to the vitality of the system, imparting vigor to the mind, elasticity to the body, and elevation to the moral feelings and power of the man.

SEA SICKNESS is caused in great part by the confusing effect which the tossing on the water has upon the brain, and multitudes of ways have been pursued for avoiding or at least mitigating this annoyance. The best plan is to let it have its course and rid the system of that excess of bile which is almost always present in this over-eating age; the general health rarely fails to be greatly improved by it, although in very rare cases, perhaps not over one in a million, dies under the effects of the long continued and exhausting retching. If a person will lie down with the eyes closed, and not allow the head for an instant to be raised from the pillow there is an almost entire exemption from nausea and other discomforts, but the result of this course is that it will be necessary to keep a-bed during the entire voyage; the effort should be to shorten the sickness and get rid of it as soon as possible, and this is best done by not lying down at all, but resolutely keeping on the feet on deck, in the open air, if the weather permits, that is, if it is not raining; this requires moral courage and some considerable force of will and character, but it seldom fails to abridge the period of sea-sickness, sometimes to confine it to a few hours duration and then the remainder of the voyage can be enjoyed as it ought to be.

The tendency to nausea on ship-board is abated somewhat by any stimulus which acts decidedly on the nervous system, such as chloroform, brandy, opiates, etc. Irritants, such as the strongest spices, abate nausea; so will great mental emotion, in short, any thing which draws off the attention of the mind. No person can get sea-sick if the ship is on fire, nor will a person who is drunk. A brisk purgative is good just before going on board or a dose of medicine taken the night before. Still the wisest, most healthful and most expeditious method of meeting sea-sickness is to avoid all preventives, all medicines, and manfully determine to keep upon your feet and let it do its worst.

In this connection space may be given to sea voyages, and the best means of enjoying them; and first of all have a plenty of woolen clothing and wear it even in midsummer except during the middle of still days; but every day, and all day a good flannel shirt should be worn next the skin even in the tropics, to counteract the baleful effect of damps, fogs, and changes of temperature. The British government compels its sailors to wear woolen flannel shirts all the year round in all latitudes as a result of its observed necessity in keeping off disabling diseases.

PROTECTING THE FEET from the dampness of the decks is an indispensable item of health and comfort on ship-board as the boards are seldom dry for two hours at a time in any voyage. Thick soled shoes and woolen hose should be worn at all times while at sea. Much has been said and written in praise of the pure air of the sea, but as a matter of fact very little of it is obtained by passengers as a general rule, because a bilgy odor pervades the cleanest ship's cabin, and when it is taken into account that in these cabins passengers confine themselves from sundown to a late breakfast next day, and that soon after breakfast the decks, having been washed, are still wet, making it near noon before it is safe for ladies, with their thin shoes, to promenade; it is evident that a very few hours of the most pleasant days are devoted to the breathing of the pure salt sea air, and when it is remembered too, how few days at sea have an entire exemption from rain and raw winds, it is evident the much lauded good effects of sea voyages, especially to invalids, is more a myth than a reality. The truth is, to obtain the very highest healthful advantages of pure air, nothing approaches moderate, leisure working in the garden or the orchard.

Correspondence.

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

Experiments with Boiler Foam Pipes.

MESSRS. EDITORS:—On page 324, No. 21, current volume SCIENTIFIC AMERICAN, I noticed an article entitled "The Effect of Variable Calibers in Foam Pipes." I have seen and used on several occasions the "foam pipe" there spoken of, but in two only did I notice the curious fact that your correspondent speaks of, and in both cases they were attached to tubular boilers which were used to supply steam to stationary engines. In one case I experimented pretty thoroughly and attached a glass gage to the foam pipe as well as to the boiler. The pipe was three-quarter-inch, and was screwed or tapped into the top of the boiler and led from the steam space above to the water space below, near the bottom of the boiler, and was between four and five feet long and was tapped into the bottom the same as at the top, so the difference in diameter could have been but little, if any.

When getting up steam the water always stood highest in the boiler which I attributed to the increased bulk of the water by heat, while that in the pipe was yet cold and weighed more than that in the boiler, bulk for bulk. But when I opened a cock at the bottom of the pipe and let out the cold water while the hot filled up the pipe again, it would rise to the same level as that in the boiler; the difference was not great, still I think it acts on the same principle when the steam is up and forty or fifty pounds pressure on, for with that pressure and with but little fire on and no steam passing from the boiler, the water would be the same in both gages, but when I started the engine and before the work was put on the water in the foam pipe would settle but little and as soon as the load was put on the engine, it would settle still more.

I discovered also that when the fire was out (providing, however, that it had not been out too long), and fifty or sixty pounds of steam on, and I raised the safety valve so as to let the steam escape freely, the water would settle as before, or if the steam was low and I increased the fire, and there being a heavy load on the engine at the same time, the same effect as before, only the depression of the water was more marked.

From this it will be seen that the water rose or lowered in the pipe just according to the amount of heat and quantity of steam used. I judged from this that while the water was in a state of ebullition and full of minute globules of steam passing upward to the surface, which would increase its bulk, (while it is obvious that the water in the pipe is perfectly quiet,) it could not receive heat enough from those two three-quarter-inch holes to cause it to boil, although at the same time it might be nearly as hot as that in the boiler.

The cause of its settling when the safety valve was raised (the fire having been put out previously), I attributed to the decreasing pressure causing the water to boil, on the same principle that hot and nearly boiling water placed under the receiver of an air pump will boil. My theory may be wrong, but I shall feel justified in holding to it till I hear a more plausible one. D. A. MADDOCK.

Lenoxville, C. E.

Relative Size of Pump Barrels and Tubes.

MESSRS. EDITORS.—J. P. B., on page 359 current volume of the "SCIENTIFIC" notes difficulty in raising water 25 feet through 56 feet of pipe, with a pump of 2½ inch barrel. I think that a smaller sized pump barrel should be used, also that the draft pipe should be large. In a similar case I found that a large pump, though it would raise the water, worked so hard that its use was impracticable, while a much smaller one works easily and delivers the water freely. Scientifically, the reasons for such a result may be seen as follows:—

1st, The pressure upon piston valves of different sizes in sustaining water at the same hight is in proportion to their areas.

2d, The pressure upon the same valve at different hights is in proportion to the hights.

3d, The pressure on valves generally must be in proportion to the products of their areas into the hights at which the water is sustained or raised. With a given power at the pump handle, therefore, it is plain that as the hight of the water increases, the area of the valve (or cross section of the pump barrel) must decrease.

Again, the smaller the tube through which it is drawn the greater the amount of the friction of the water against its sides in delivering the same quantity of water; and the larger the pump the greater the quantity of water required in the same time, which would also increase the friction, consequently by increasing the size of the pump and diminishing the size of the tube, a limit would always be found beyond which, because of friction alone, the water would refuse to obey the action of the pump.

In conclusion it may be remarked that inasmuch as the increased size of the draft tube will not in the least effect the amount of pressure on the piston at vent, it will in all cases be found advantageous to the easy and free delivery of the water to use large tubes rather than small ones, especially where they must be of great length. M. N. HORTON.

Oneida, N. Y.

Electricity.

MESSRS. EDITORS:—Electricity is defined to be the name given to an imponderable agent which pervades the material world, and which is visible only in its effects. It is exceedingly elastic, susceptible of high degrees of intensity, with a tendency to equilibrium unlike that of any other known agent. Whether it resides only on the surface, or penetrates into the interior of a conducting body, appears to be a matter of dispute among electricians, at least in regard to dynamical electricity, though it is difficult to imagine why there should be any difference in this respect between the statical and dynamical. If electricity be material, it must possess gravity, and attract and be attracted as other bodies. All bodies would be surrounded by an atmosphere of electricity, each in proportion to its mass, or what would be the same in effect, the the electricity (from its exceedingly elastic nature penetrating all space) would be more or less dense in proximity to other attracting bodies. If the mass of a given body should be by any cause reduced, it is evident that there would be a corresponding want of capacity to attract or retain electricity, and the equilibrium would be restored by the excess passing to some other body. A current would be formed by reducing the mass of friction (as in the electrical machine), or by oxidation (as in the galvanic battery), in consequence of one body attracting electricity from another constantly diminishing body. The attraction of gravitation would seem to be the immediate, and the reduction of the mass of a body, the primary cause of a current of electricity. A telegraph wire having its own atmosphere of electricity, a wave communicated to one end would be propagated through its entire length. In an electro magnet the atmosphere of electricity being put in motion by the current of the surrounding coil, would form an electric screw, which at one end (pole) would screw into and attract, and at the other end (pole) would unscrew and repel the electric nut of another magnet. Having been engaged for some years in perfecting a machine for developing the motive power of electro-magnetism, these hints are offered more for the purpose of obtaining information than of imparting it. FRANKLIN.

Cairo, W. Va.

Some Questions on the Day Line Matter.

MESSRS. EDITORS:—Please give the following questions a place in your paper for the consideration of its readers:

Suppose a man start from New York on Monday noon, go west, keeping pace with the sun, in his journey around the globe, where would he pass from Monday to Tuesday?

When it is Monday noon at New York it is 48 minutes past midnight at Pekin, in China; is it Monday or Tuesday at Pekin when it is Monday noon at New York?

When it is Monday noon at New York, how far is it Monday east and west from New York on the globe?

Is there a certain point of time in the revolution of the globe when it is Monday, for example, on the entire globe and twelve hours from that time, Monday on one half and Tuesday on the other?

Is there a certain point on the globe where the days of the week begin and end; if so, where is it, and what cause has fixed that point?

These are no visionary questions, and can be readily and definitely answered. LYMAN THAYER.

Burlington, Vt.

Musical Vibrations.

MESSRS. EDITORS:—The above subject being before the readers of the SCIENTIFIC AMERICAN from an article in a late number, I would inquire if the squeaking and chattering of lathe tools has been observed as a method of indicating the frequency of the vibrations. The tone being observed and the velocity of the moving surface known the chatters on a given space may be counted with apparently a correct result. A side tool with large work, not too firm, affords eligible conditions for the experiment. H. W. C.

Newark, N. J.

The Paris Exposition gives 16,000 medals. As each will bear the name of the recipient, they will not all be ready before next March.

Improvement in Hoops for Children.

The engraving represents a hoop with its handle, the design and operation of which is perfectly clear without a detailed description. Attached to the hoop is a split or slotted handle having four rollers bearing alternately on the inside and outside of the hoop and allowing it to turn with the greatest ease. The young operator grasps the handle, inclines forward, and and starts on the run, when the hoop obeys the impulse and the flag streams out inviting him to follow. As the hoop cannot escape the direction in which it is guided, the child is not compelled to retrieve his toy from the mud of the streets nor risk his safety by getting in the way of passing carriages. This device makes hoop rolling practicable for very young children who have not acquired sufficient skill to govern the course of a hoop by the ordinary stick.

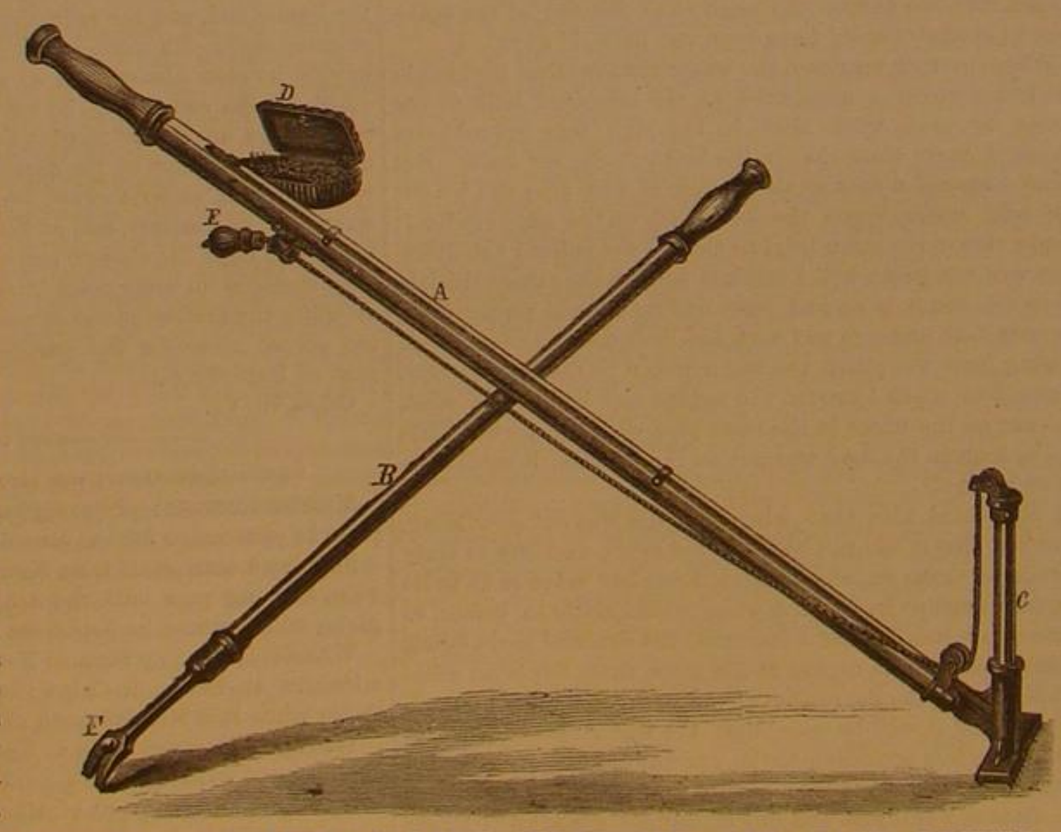
It was patented July 16, 1867, by James Faye, who may be addressed for rights or further particulars at No. 476 Pennsylvania Ave., Washington, D. C.

FAYE'S PILOT HOOP.

Device for Stretching and Laying Carpets and Drawing Tacks.

One of the most unwelcome and tiresome jobs of house-cleaning and household removal is the annoyance of taking up and putting down carpets. There are aching backs, sore knees, and pounded fingers, to be expected as inevitable. These are wholly avoided by the carpet stretcher and tack driver shown at A, in the illustration. This tack driver and stretcher consists of a wooden handle of convenient length for stretching a carpet without compelling a stooping position for the operator, while at the same time allowing the weight of the body to act at the greatest possible advantage. At the bottom of the foot of the upright, C, and placed at the proper angle, is the stretcher, so constructed with two rows of serrated teeth that the hold taken upon the edge of a carpet is such that no damage can happen to either the most expensive or the thinnest carpet, as frequently happens by the usual stretchers, while the carpet is stretched stronger and more evenly with a much less expenditure of strength than by any other method.

Recessed on the upper side of the handle is a small brass tube, which leads into the base of the upright, C. Into the upper and open end of this tube, near the tack box, the tacks are fed one by one, either leathered or of the ordinary style, and of any size, as fast as wanted, which instantly descend by their own gravity under a hammer inclosed in C, which is raised by the cord and handle, E, against the tension of a strong spiral spring, which upon releasing the cord, is thrown with great force upon the head of the tack, driving it, at one blow, home. When the tack first falls into the base of the upright, C, the point drops into an inverted hollow cone, having a small aperture at the apex, and split longitudinally into three equal parts, held together by a simple rubber spring. While the point and body of the tack drop through the opening, the tack is prevented by the head from passing through until the blow of the hammer overcomes the slight tension of the rubber spring, and at the same time instantly drives the tack into the carpet. Having ourself tested this useful implement in putting down two carpets, we have not known it to fail in a single instance of driving the tack entirely home.



BROWN'S COMBINED CARPET STRETCHER AND TACK DRIVER.

It is evident, at a glance, when working upon a new or too small a carpet, where it has heretofore taken two persons—one to stretch while another drives the tacks—that this saves the labor of one person entirely; while the tack can be driven nearer the base or mop boards than by any other method.

Since the teeth of the stretcher do not project through more than one thickness of a carpet, the facility with which a carpet can be doubled under (or what amounts to the same thing, over) as it is laid, is not one of its least advantages.

The adaptability of this labor-saving implement for driving tacks in the most inconvenient nooks or corners can be readily appreciated by our American wives and housekeepers, as calculated to lighten their cares and labors. The tack box, D, is adjustable at any angle, to provide against spilling the tacks while moving the instrument. The tack drawer shown at B, represents a long-handled and peculiar claw, which, by reason of its length and projection, F, which acts as a fulcrum, extracts tacks as quickly and easily as the driver puts them in, without stooping or exertion.

These devices attracted great attention at the American Institute Fair, held in this city last September and October, and received there the highest premium.

They are patented in this country under two patents granted Wm. Brown, of Springfield, Mass., dated Feb. 5, and July 30, 1867; and are also patented in Great Britain, France, etc. Wm. M. Evans & Co., 55 Beekman street, are sole manufacturers for the United States and Canadas. G. E. Harding, General Agent for New York city and New England States. 726 Broadway, New York. By reference to the advertising columns it will be seen that agents are desired immediately for its sale.

Modified Collodio-Chloride Process.

It is often a matter of considerable value in photography to take up an old process, or an old idea, and view it in the light which the experience of years is capable of shedding around it. Much good might result to photography if all working at the art would occasionally look back on the days gone by, and seek out the good and useful of the past for the purpose of molding it to the requirements of the present or the prospects of the future. An old idea revived, but clad in a new dress, now and then makes its appearance, often at an opportune moment. This remark is specially illustrated by some photographs lying beside us as we write, and which, for delicacy and beauty, could scarcely be surpassed. The mode in which these were produced we shall now briefly describe:

A good sample of collodion is obtained—one which will yield a rather tough but not too contractile film answers better than any other—and to the sample a soluble chloride, such as chloride of calcium, is added in the proportion of four grains or five to each ounce. Of course the salt should not be added directly to the collodion, but a solution made as follows:—Chloride of calcium, 16 grains; alcohol, 1 ounce. Two fluid drachms of this solution are added to six drachms of the collodion, and the proper strength thus ensured.

A thin specimen of enameled paper is now selected and coated with the collodion, just as an ordinary plate is covered with the film. The paper now resembles ordinary albumenized paper, and is submitted to similar treatment in the successive steps of the process. It is floated on the ordinary nitrate of silver solution, and, when dry, exposed under a negative. The printing is quickly effected, and on removal from the frame, the proof is washed in water and toned. In the case of the prints before us the ordinary alkaline gold toning bath was used with excellent effect. The fixation and washing are conducted in the usual way.

The process is very simple and useful for many subjects requiring the rendering of the most minute detail, as the *cartes* before us will bear close examination with a powerful magnifier, and when thus scrutinized, not only bear ample testimony to the capabilities of the process, but also to the quality of the negatives from which the proofs were obtained. There is another element of some importance in these prints, which is not to be neglected, now that we have had such good reason to discuss the probabilities of the permanence or otherwise of our prints. We refer to the fact that as the increased delicacy in the rendering of detail is ensured by keeping the sensitive material on the surface of the paper, so is the integrity of the particles of metal constituting the finished print ensured by their envelopment in so indifferent a body as collodion is generally believed to be.—*British Journal of Photography.*

A Good Old English Patent.

Specification of the Patent granted to Henry William Vander Kleft, of No. 253 High Holborn, in the County of Middlesex, Gentleman; for a method of constructing a Walking Staff, to contain a Pistol, Powder, Ball, and Screw Telescope, Pen, Ink, Paper, Pencil, Knife, and Drawing Utensils. Dated August 17, 1813.

To all to whom these presents shall come, etc, NOW KNOW YE, that in compliance with the said proviso, I, the said Henry William Vander Kleft do hereby declare that the nature of my said invention, and the manner in which the same is to be performed, is described and ascertained in the following explanation thereof; that is to say: The staff is about the usual length of a common walking cane, and is made of brass, and may be covered or veneered with prepared whalebone, leather, or any other substance, and the shape is round and rather conical, tapering from the head to the point. It is divided into nine parts, principally tubes (exclusive of the cap or head, and the top or lid of the inkstand), which are all screwed together, except that part containing the pistol, which is fastened by means of two spring catches fixed opposite each other. The first or uppermost part or division is an inkstand, with a metal lid screwed thereon, and a small hole in the center of such lid for a pen to pass through, and a metal knob or button to screw into the hole as a stopper, when the stand is not in use. The cap or head of the staff screws on the inkstand, and may be made of silver or any other metal. The second part serves for the handle of the pistol (which is made of iron), and fixed in the lower end thereof, the barrel being about five inches in length, and about half an inch in diameter; the trigger shuts in underneath the barrel, and is projected by the act of cocking the pistol; and the pistol is kept at half-cock, as well as the pan fastened down, when not in use, by a small bolt, affixed to the upper side of the barrel, the removal of which disengages the pan, enables the pistol to be brought to the full cock and discharged. In the upper end of the second part is placed a piece of wood, with three small holes, to receive a penknife, pen, and blacklead pencil, and the wood is covered with a brass or silver plate, with correspondent holes; the distance of the plate from the opening is about an inch; and on each side of the second part, near the middle, is fixed two small silver loops, through which pass a leather strap and tassel, to put round the wrist of the person carrying the staff. The third part is a hollow tube or case, for the reception of the pistol, with a narrower circular space at the bottom, to fit the muzzle, and keep it steady in the case; and immediately underneath which space is a distended worm spring made of steel, with a small circular brass plate, upon which the muzzle of the pistol rests or presses; the use of which spring is to throw off the pistol case and the lower part of the staff from the pistol immediately on pressing the spring catches. The fourth part is about eight inches in length, and forms a telescope, with two or more brass sliding tubes. The fifth part of the staff is a hollow tube, or case, for carrying writing or drawing paper in. The sixth part is a hollow tube or case, for carrying a piece of India ink, and several hair pencils. The seventh part contains a turnscrew, for taking off the fore part of the pistol barrel when it is to be loaded or cleaned. The eighth part is a small case for containing gunpowder. And the ninth part is a case containing the pistol balls. The eighth and ninth parts are made of brass, and form together the ferrule of the staff.

To Preserve the Health of Gold Fish.

The following rules for keeping gold fish in a healthy condition have been furnished by a correspondent:

"For each quart of water only one fish, as gold fish cannot thrive if crowded. Do not change the source of water whether from well or hydrant. In summer renew it daily; in winter only every second or third day.

"Shallow glass dishes should not be used. They should be deep and kept in the shade, strong light and a heated room being detrimental to the fish. The bottom of the globe should be covered with smooth gravel to absorb the excrements and keep the water clean.

In changing the water for cleaning the globe you should take the fish out with a fine net, but never with the hand. Do not feed them with bread or cake or any food containing tannin; but give them wafers, ant eggs, flies, yolk of eggs, water cress, etc., but only once in three or four days and then sparingly.

"In the months of November, December, January, and February the fish should not be fed at all, as this is their hybernating season and food in this season is unnatural. In March, April and May they should be fed scantily.

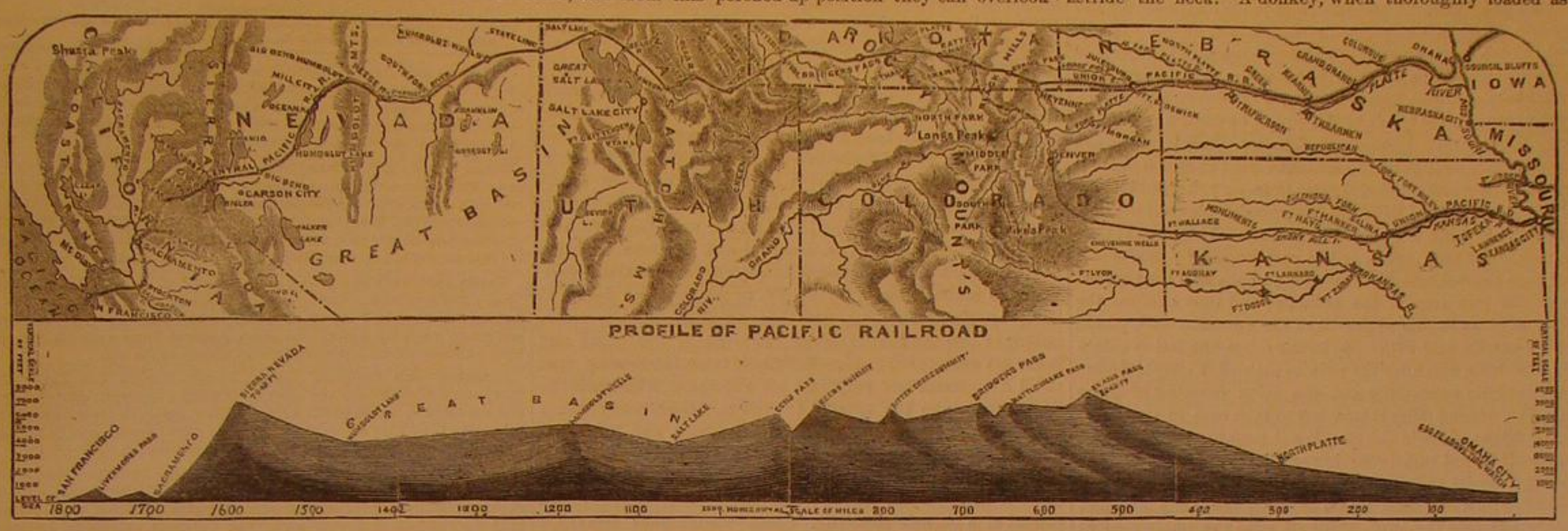
"If these rules are followed the aquarian ornaments of your homes will live and thrive for many years."

THE amount thus far subscribed for the Governor Andrew Family Fund, in Massachusetts, is eighty thousand dollars.

The Great Trans-Continental Railway Line.

We have published several articles describing the object and mode of construction of the great railway line from Omaha, Nebraska, on the Missouri River, to Sacramento, California. The line has, however, been generally mentioned under the title of what may be considered its eastern division, the Union Pacific Railroad, while in fact there are two companies, the one at the western end being known as the Union Pacific; and this company is building the road from Sacramento east to Salt Lake.

By the map which accompanies this article, it will be seen that this company has completed over 160 miles of the road, having reached the summit of the Sierra Nevada. The serrated lines show the roads as built, and the smooth lines the route and length of the unfinished portion: except that the former do not extend quite far enough to show the amount completed at the time of publication of this issue of the SCIENTIFIC AMERICAN. The Union Pacific Road is expected to be completed to Evans Pass, a distance of 555 miles from Omaha, by January 1st, 1867.



THE CONTINENTAL RAILROAD—MAP AND PROFILE MAP OF THE LINE FROM OMAHA TO SAN FRANCISCO.

The preliminary organization of the Union Pacific Railroad Company was made in October, 1863. The first contract for construction was made in August, 1864; but various conflicting interests, connected with the location of the line, delayed its progress, and the first forty miles were not laid until January, 1866. At that time all obstacles were removed, and the road has been built more rapidly than any other similar work in the world. There were 305 miles completed on the 1st of January, 1867, and contracts have been made for rock cuttings, to be done during the winter. The work on the California end of the route is being pushed forward with great energy toward the east, and it is expected that the whole grand line to the Pacific will be open for business in 1870. The present outfit of the company comprises ample depots, stations, car and repair shops, and all the equipments of a first-class road. It has now in use fifty-three locomotives, twenty passenger and mail cars, and seven hundred and ninety-three freight cars. The financial condition of the company is fully exhibited in an advertisement in another column.

EDITORIAL CORRESPONDENCE.

From Paris to Madrid—The Character of the Country—Bordeaux and its Wine—Pau and its Climate—The Spanish People—Agriculture, Manners, Customs, Towns, and Cities—A Spanish Railway.

MADRID, November 18, 1867.

The troubles in Italy have turned the tide of continental travel toward Spain, and although this old dominion is familiar to most American readers by the writings of Prescott, Irving, and Ticknor, yet few comparatively of our countrymen ever visit it. A railway is now complete from Paris to Madrid, and thence to Cadiz, at the utmost southern verge of the Peninsula, with connecting links to Barcelona, Alcante, Carthagena, and Malaga, on the Mediterranean, to Lisbon, in Portugal, and to Bilboa, Santander, and St. Sebastian, on the north. The express train runs from Paris to Madrid in forty hours, but those who wish to perform the journey in an easy and comfortable manner will not omit to stop for a short time at the interesting old city of Tours, and thence on to Poitiers—both of which are filled with thrilling incidents connected with the life and times of Louis XI., Catharine de Medicis, and other great characters who have so swayed for good and evil the history and destiny of France.

A day spent in Bordeaux will well repay the time. It is a large thriving city, and stands literally above vast catacombs of wine and brandy barrels Its noble river, the Garonne, throngs with vessels from all parts of the commercial world, and is spanned by a massive stone bridge of 1,596 feet in length, supported upon heavy piers, the finest structure of the kind in France; the quay extends along the banks of the river for a distance of three miles, and presents a busy scene of rumbling wine carts, and a strange mixture of peoples and tongues. We visited the wine cellars of one of the largest firms in the trade, and were conducted through cellars and passages lined with hogsheads and stacks of bottles filled with the choicest vintages of the country. We noticed tier upon tier of bottles covered by the accumulated mold of a quarter of a century, quietly reposing in iron frames or stone vaults, increasing every day in value, and destined some time to tickle the palate of the epicure. Here is also to be seen a fine fragment of an old Roman amphitheater, built in the days of the Emperor Gallienus, and capable of holding 15,000 people. Its solid walls and massive arches attest the substantial character of Roman architecture, and seem likely to stand, while more modern structures crumble and fall to dust.

For a distance of sixty miles beyond Bordeaux the railway passes over a wide desolate plain of shifting sands, whose soil, cold, wet, and barren, barely supports a thick growth of briary shrubs, and some dwarf pitch pines, which supply the government with resin and turpentine. Upon the open treeless portion of these plains sheep are pastured to a considerable extent, tended by shepherds who walk upon stilts, and from this perched-up position they can overlook their flocks, and prevent them from straying.

In appearance, one of these peasant shepherds resembles a tall man upon two wooden legs; and so expert are they, that by the aid of a long pole, they can clear the country with the rapidity of a horse at full trot. They suffer great privations, and are short-lived; but they are Frenchmen, and prefer this nomadic life rather than emigrate to a land of plenty. Statistics show that in 1864 less than two thousand Frenchmen permanently emigrated from their much-beloved country.

From the old town of Dax—so famous for its dry bracing air—a branch road runs to Pau. The country all along this route is very beautiful and generally fertile. A most charming feature of the landscape is the well-fenced farms with noble farmhouses and outbuildings located thereon, the same as in our own country. It was pleasant also to see roses blooming in the gardens, and the farmers with their carefully blanketed oxen engaged in plowing, sowing, and other agricultural labors. I enquired the reason why working cattle when at work were kept covered with blankets, but no good reason could be assigned beyond the fact that the custom was immemorial—descending from father to son. As in other European countries the yoke is fastened to the heads of the oxen by means of straps wound around the horns, which seems to me a system of cruel torture, but it is old, and as custom among farmers in Europe appears to be arbitrary it would be useless to reason with them that the yoke upon the shoulders is far better than the one which they have inherited. Be it said however to the praise of the inhabitants of the Basse Pyrenees, the men instead of the women perform the labors of the field. Why is this? Simply because they have a better and more advanced civilization, for which they are mainly indebted to King Henry of Navarre, and to Margaret of Valois, who were not too bigoted even in those rude times, to listen to those who led the vanguard of freedom from ecclesiastical tyranny and oppression, a work that is now rapidly advancing throughout all Europe, and will continue to advance proportionately as the minds of men begin to think and act upon intelligent and independent convictions.

Pau has a fine old castle, where good King Henry IV. was born, Dec. 13, 1553. The apartments are grand, and, strange to say, cheerful—a comfort which is usually wanting in all other kingly palaces that I have visited. The royal bed, and the tortoise shell cradle wherein His Highness was rocked, are still preserved among the curiosities of the castle. From the high tower where Margaret of Valois gave asylum to John Calvin, and listened to his stern preaching, a grand view is had of the Pyrenees and surrounding country. An other old tower was used alternately to imprison Romanists and Reformers, but history does not inform us that "pure religion and undefiled" was ever advanced by prisons and persecutions. Pau, which ranks as one of the healthiest spots in Europe, is a place of great resort for consumptives. Their wasted, tottering frames are seen moving about the streets, receiving temporary inspiration from the bracing air, but only to add, it may be, a few more days to their lives. The constant presence of so many "sick, lame, halt, and blind," in this beautiful and healthful spot, of course detracts from its pleasures to those who, more happily circumstanced, might desire to remain and enjoy the fine scenery and the charming excursions through the neighboring mountains. A few miles beyond Bayonne we stopped at the old town of St. Jean de Luz, where Louis XIV. married Maria Therese, the Infanta of Spain, daughter of Philip IV., in 1660. In honor of this event, the authorities of the town closed the door through which the royal pair entered, and it has remained shut ever since. The inhabitants are delighted to show the house where their Majesties passed the bridal night, previous to setting out for Paris.

Returning to Bayonne, the birthplace of the bayonet, a strongly fortified city, the key to the passes of the Pyrenees on the west, we took a carriage and rode over to Bairritz, a distance of six miles, the imperial salt watering place, where the Empress Eugénie and her husband Louis have a fine villa close to the seashore. The Empress has also erected a little chapel within the enclosure of the surrounding grounds, and is very justly regarded by the people as a kind-hearted and pious lady The splendid and well shaded roadway was thronged with mules and donkeys, with immense panniers thrown across their backs, and it was no uncommon sight to see a female seated upon these venerable animals, with her feet hanging astride the neck. A donkey, when thoroughly loaded as I have frequently seen them, affords a most grotesque sight, as often under a pile of bags or brush, nothing of his corporeal frame is visible except the ears, nose and feet.

At the poor, miserable town of Irum, we reached the Spanish frontier, where baggage is searched and cars are changed. The gage of the Spanish railway is a few inches broader than the French, so constructed in order to prevent the running of cars across the border in time of war. The examination of the Spanish officials is very strict, and an armed guard is maintained at all the stations, who search the trains, and lynx-eye all the passengers to discover concealed weapons, and, if possible, to detect revolutionary design. After a delay of an hour and a half, we set out on our journey toward the interior, thankful that we had escaped with so little annoyance. We were permitted to enjoy the complaisance, however, but for a brief period, for on reaching Miranda, a station some six hours journey from Irum, our baggage was again thrown out of the car, and underwent another examination, and one of the guards entered our car and commenced searching under the seats and carpets, and ended his investigation by pounding vigorously upon the cushions and upholstery. Nothing of a warlike character being discovered, we were permitted to pursue our journey in peace until we halted for the night. The recent attempt at revolution in Spain has excited the authorities to an excessive vigilance, and strangers are looked upon with suspicion. The night of our arrival at Burgos, the train bound for Paris was attacked by a band of brigands, who expected to plunder a large amount of bullion belonging to the government, but they missed the prize. The engineer, however, was killed, and some depredations were committed upon the passengers. We saw one of the brigands being marched through the streets of Burgos the next day, on his way to prison, escorted by two armed guards.

Our first night's experience in Spain was had at Vitoria, an old, wind-blown, weather-beaten city, containing about seventeen thousand inhabitants. Vitoria is historically celebrated as the spot where the Duke of Wellington, in 1813, encountered the forces under Joseph Bonaparte, who was the acting king of Spain. Joseph was badly whipped and ran off, leaving an enormous amount of plunder in the hands of the Iron Duke. This victory resulted in the final expulsion of the French from Spain. The town has the usual Spanish Plaza, with very narrow streets, which emit the foulest odors, through open gratings of cesspools that receive all the sewerage of the houses, without the necessary draining. No carriages or vehicles of any sort are seen upon the streets, except a few ox-carts, having solid wooden wheels bound by a thick iron tire, and a few iron straps on the sides. In some cases a thick wooden rim, or double felly, secured by pins, is used in place of iron. The water necessary for domestic purposes is collected at the public fountain in the Plaza, in large water jugs, such as the woman of Samaria brought to the well, and these are carried either upon the heads of women or the backs of donkeys. The priests are numerous, and are are really the only fine looking men I have yet seen in Spain. They have usually pleasant, intelligent faces, and walk about the streets with great dignity, clothed in their flowing black cassocks and broad-brimmed, turned-up hats. They enjoy the cigarette, and in one instance we noticed a group of them descending the steps of San Miguel after morning mass, puffing the smoke of these little paper rolls. The moment the Spanish territory is entered, the observing traveller notices a complete change, not only of language but also in the appearance of the people, manners and customs, as well as in the character of the country itself. The French are gay,

light-hearted and cheerful and fond of amusement, and particularly polite and attentive to strangers. The Spaniard, muffled within the folds of a huge cloak, appears dull and taciturn, and being naturally suspicious, he seems reserved and manifests no interest in what is going on around him.

The towns are a fitting type of the Spanish character, and many of them have stood unchanged for centuries, apparently unconscious of the stirring activities in the world beyond, but steam and electricity have at last crossed the Pyrenees, and entered these abodes of mournful desolation, and sooner or later a newer and better civilization will reanimate them into a new existence.

The people pride themselves upon their ancestral renown, and in the Basque Provinces they claim to be the descendants of Noah and Tubal. Their antiquity is well attested by the rudeness of their agriculture and the few, uncouth implements which they employ. The plow is made of the trunk of a crooked tree with a lower branch sharpened and faced with a thin sheet of iron. The trunk forms the beam, and lies obliquely between the heads of the mules or oxen, no chains or traces being used. Heavy, ugly-looking stuffed collars are placed upon the necks of the mules, in front of which there is also a strong wooden yoke, similar to an ox yoke, but instead of bows it is provided with two long wooden pins at each end, to prevent it from slipping off the neck. This yoke is then fastened to the plow beam, or to a cart tongue, by means of a long rope twisted several times around both and then passed under the fore legs of the animals; and thus equiped the plowman holds in his right hand the upturned end, which forms a handle, and with whip in the other, the soil is thinly skimmed over, and after the corn is planted, I should judge from its sickly appearance and the thick covering of grass upon the ground that it was left to take care of itself. In some portions of Spain the plow is not used to open the green sward. It is not sufficiently heavy for that purpose, but the labor is done by men working in gangs, who use a heavy, long-tined fork or spade, which is raised above the head and forced down into the turf. They all raise the implement at the same moment, and throw it violently into the ground. Women usually follow with hoes, to break the clods—truly a curious sight, and an evidence that their claim to relationship with Noah is tolerably well founded.

The topographical character of northern Spain is somewhat peculiar. It is interspersed with bare, desolate-looking mountains, scattered about in promiscuous disorder; timberless, fenceless plains, and some apparently fertile valleys; poor villages of low stone houses or huts, covered with red tile—windows often without glass; a huge church of rough stone wholly destitute of architectural symetry and effect; peasants dressed in fancy costume; men, women, priests, donkeys, dogs and hogs make up the picture of a country nowhere better portrayed than by their own author of Don Quixote and Gil Blas. The domestic architecture of Spain belongs to a ruder age, but the country is especially distinguished for the grandeur and magnificence of its ecclesiastical edifices, as also for its many interesting remnants of walls, towers, and fortifications of the Roman, Moorish, Gothic, and Castilian periods. For example, in the dull, decayed old city of Burgos, a place of less than twenty thousand inhabitants, there is an old cathedral erected by King St. Ferdinand in the thirteenth century, which is one of the most sublime Gothic structures to be found in Europe, and strikes the mind of every beholder with wonder and astonishment. The exterior effect of this noble building is much injured by its unfavorable location and the mean buildings which have been erected close to its side walls. Nevertheless the principal front is excedingly fine and the spires and pinnacles rise most beautifully in richly carved open work, so that on a clear night the stars may be seen glittering through them. The interior is in the form of a Latin cross, 300 feet long, 213 feet wide, and 193 feet high. Independent of the magnificent central nave with its elaborate ornamentation and fine retalbo, or high altar, there are two lateral naves and fifteen distinct chapels, some of which are as large as an ordinary church; besides these there are also extensive cloisters, and other church appurtenances, the whole containing fine tombs, sculptures, and paintings of ancient date.

At the time of our visit morning mass was being celebrated in all the chapels and also at the high altar by upward of twenty priests and groups of worshippers, chiefly women veiled in black, were kneeling upon the cold marble pavements, and so far as the outward eye could descern they were offering up devout prayer either at the shrine of the Virgin or before a carved embodiment of a suffering God.

There are several very curious relics in this cathedral which are held in high veneration by the inhabitants of Burgos. For instance they have the Christo de Burgos, a wooden image of Christ which was, according to their traditions, carved by Nicodemus, a ruler of the Jews, shortly after he and Joseph of Arimathea had buried our Lord. It was rescued from a box found floating in the sea. The hair, beard, eyelashes and thorns are real, and the image is said to sweat on Fridays, and even to bleed on certain occasions. The image is dressed up in an embroidered petticoat after the modern fashion. There is also an image of St. Cecelia, a recumbent figure, to which is ascribed the special virtue of curing aches and pains about the head. The devotees of this saint bring their tresses to the shrine under the belief that by so doing they will be cured of the headache. This faith in the virtues of a wooden saint is much more sensible than the more common one that resorts to the advertised nostrums of quacks, which flourishes no where so extensively as in our own country. Here is also to be seen the famous old trunk of Mio Cid, the legendary hero and poet of Spain, who being short of money to prosecute his campaign against Valencia resorted to the sharp financial dodge of filling the box with sand and pledging it as so much gold to the Jews for a liberal loan of hard cash. The bones of the Cid and of his faithful heroic wife Jimena are carefully preserved in a walnut case. The dust is corked up in a beer bottle and is shown to strangers in a room fitted up as a chapel in the old town hall. In this same building is also preserved the first throne of the kings of Castile, a very common old wooden arm chair. Burgos has several very extensive monasteries and convents which are no longer permitted to flourish in Spain as in former times.

At Valladolid, formerly the capitol of Castile, once an imperial city, now much reduced in circumstances, we visited the old house where Christopher Columbus died May 20, 1506. It is a plain two-story building, stucco front the lower story striped to imitate stone, the upper painted to imitate columns with scroll work capitals. On the outside just above the door a carefully sculptured medallion has been inserted which represents the head of Columbus, a globe, anchor, scroll, and a horn of plenty. Underneath are the words "*Aqui Murio Colon*," "Here died Columbus." A large old building called the Audiencia, now used as a court house, contains the room where Ferdinand and Isabella were married Oct. 18, 1469. It is a very plain apartment with an altar at one end before which it is supposed that the royal couple pledged their marriage vows. Phillip the II., of Spain, was also born here in an old brick palace now deserted and opposite to this is the house once owned and occupied by the learned Gondomar, who was ambassador of Philip IV. to the Court of James I., King of England. The poor old dwelling of Cervantes, author of Don Quixote, is one of the lions of the place and bears his sculptured head. Valladolid is an interesting spot to all Americans, but very few even of those who travel in Spain ever take the trouble to visit it. Like many other Spanish cities its ancient glory has departed, and it appears to have retired from active business.

The railway between Irun and Madrid is a stupendous piece of engineering, and but for the enterprise, skill, and capital of a French company, Spain would have remained isolated, a sort of political fossil whose glory reverts to the buried centuries of the past.

There are upward of seventy tunnels on the line, of which one that pierces the Guardarama mountains is three thousand feet in length, cut through granite mixed with gneiss and other crystaline schists. The cars are comfortable and good order and regularity are as well maintained as upon European lines, in spite of the grumbling tourists and letter writers of England, who, according to John Murray, do more growling than any other traveller.

S. H. W.

The Patent Office.

With the additional force of newly-appointed examiners, and the extra hours of duty performed by all the examiners, the accumulated work of the Patent Office has been nearly brought up. There are now but few classes that are more than a few weeks behind in examination, while most of the rooms are entirely cleared of back cases.

As an indication of the enterprise of the Patent Office, see the long list of patents reported in these columns every week. We received from Washington by a single mail last week official circulars of allowance of FIFTY-ONE patents, all solicited through this office.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The percentage of female operatives to males, in all the mechanical operations carried on in this city, is 37·18; in Philadelphia, 44·81.

It is stated that Mr. Winans of this country has proposed to buy the Moscow railroad, so long in the market and recently offered to the Russo-French company by the Government. He is willing to pay 25,000,000 roubles ($19,700,000) within a year, besides undertaking to amortize a former loan.

The Turkish government is trying to turn to account its forests and mines but the want of means of communication in the interior is an almost insurmountable barrier, So in spite of the great mineral wealth of the country no one will take the mines. One forrest district in Bosnia has been however sold, and is expected to yield $100,000.

Operations on the railroad which is being built to the summit of Mount Washington have ceased for the season. A new company have been organized fixing the capital at $300,000. A little over a mile of the road has been constructed and it is expected that the balance will be finished next year.

Creusot employs 9,000 workpeople. The blast furnaces there turn out 130,000 tuns of pig iron annually, while the forges produce 100,000 tuns of wrought iron in the same period.

In the ordinary method of manufacturing alloys of copper and zinc, the copper is first melted and into the molten mass the zinc is introduced in a solid state. By a late English patent it is proposed to melt both metals, pour the melted zinc into a ladle situated near the melting furnace, and afterwads pour the melted copper into the same vessel, the mixture is then stirred, and the combination takes place, the heat which is evolved in the act, raising the sensible temperature of the alloy and preventing the undue cooling which would result but for the said evolution.

A Mr. Sibert of Staunton, Va., has, it is stated discovered a process for converting iron ore directly into cast steel by a single operation in an ordinary furnace. This gentleman is now laying a number of steel rails made by this process on the track at Staunton and we may hear more from them hereafter.

Since the closing of the war the gold field of Georgia is again engaging attention. In former years the yield of gold was so large that Government established a mint at Dahlonega, Lumpkin county, in the western part of the State. Orders have been recently given to have this mint which was necessarily closed during the war, opened again. Three large ingots of gold from the Levis gold mine valued at $4,500 the product of one week's work at the cost of $1,100 were recently exhibited in Washington.

The process of galvanizing iron, as practiced in one of the leading establishments of Philadelphia is as follows:—Selected sheets of iron after being trimmed to requisite size and cleaned by a weak acid solution, are rolled smooth, then dried in an oven and each sheet placed in contact with zinc. Both metals are raised to unequal heat and thus fusion is effected. The regulation of the heat necessary to metallic combination is a point of nicety and care.

The highest elevation ever reached by the railroad is a point on the Pacific road, 8,246 feet above the ocean level or more than four thousand feet higher than the summit of Mount Cenis.

Twelve hundred tuns of steel rails have been substituted for iron ones on the Boston and Providence railroad. At Roxbury they have been in use for upwards of a year, at a point when one hundred and twenty trains or locomotives pass over them daily but there is as yet no perceptible wearing away. Iron rails had to be relaid seventeen times a year at the same place.

The rapid growth of the town of St. James, in Missouri, shows what railroads are now doing in developing the country. St. James, on the line of the Southwest Pacific Railroad, was laid out in 1859, but owing to the war but few buildings were erected for several years. In 1866 the population amounted to about 1,500. Within a year past there have been erected, or put under contract, as many new buildings as the town contained last year.

About 25 miles from Santa Fe, New Mexico, is an extensive bed of coal which has been pronounced by experts true anthracite, and is so far as yet discovered the only anthracite deposits west of the Alleghany mountains.

Not less than thirty thousand French Artizans are employed in the manufacture of artificial flowers, and the trade in this line amounts in value to $5,000,000 every year. America is the best customer of France in the articles, demanding in the same time $1,000,000 while $800,000 worth finds a market in Prussia. England consumes $600,000 worth, Germany is a customer to the extent of $400,000, and Italy for somewhat less.

Recent American and Foreign Patents.

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

LEACHING TAN BARK.—Charles Korn, Wurtsborough, N. Y.—This invention relates to a new apparatus for leaching tan bark and consists in the use of a vat which is provided with various compartments which are connected in such a manner that the tanning liquid will continually circulate through the same in any required order or succession.

STEAM VALVE.—R. A. Filkins, North Adams, Mass.—This invention relates to a conical valve which has a perfectly smooth lower base or face and which rests on a seat in which the channels for the steam passage are arranged. A passage is provided in the valve which when brought in line with the steam pipe connects the two parts of the same while otherwise it can be so set that the passage will be completely or partly interrupted as may be desired.

WATER INDICATOR FOR STEAM BOILERS.—R. A. Filkins, North Adams Mass.—This invention relates to a device by which the hight of the water in a steam boiler can be instantly ascertained without the use of faucets or taps and which, when the water in the boiler descends below a certain line, will blow an alarm whistle and notify the attendants of the fact

PLUMBERS' AND PAINTERS' LAMP.—George Wanier, New York city.—This invention relates to a new lamp for creating a powerful flame similar to that produced by means of the ordinary blow pipe. Its object is to have a self-acting blow pipe and to produce a flame which can be used by painters for burning old paint on doors, etc., prior to applying the fresh paint.

DISTILLING APPARATUS.—Theodore Gründmann, Cleveland, Ohio.—This invention relates to a new and simple device for distilling, condensing and cooling mash, beer, cider or other suitable liquid adaptable more particularly for distilling on a small scale. The invention consists in arranging above the retort a small vessel into which the vapors pass and whence they are conducted to the cooler.

SCAFFOLD.—Clark Robinson, Rochester, Minn.—This invention relates to a portable scaffold which is to be used by painters, carpenters and masons, and which can be raised or lowered at will to any desired hight by the parties standing upon the platform of the scaffold.

CARRIAGE.—Ephraim Soper, New York city.—This invention relates to a new construction of the front support of carriages and its object is to allow the application of C-springs to the front part of carriages and also the strengthening of the top bed and upper transome plate. The invention consists chiefly in the use of a front perch which is secured or swivelled to the back bar and extends to the under side of the carriage to which it is pivoted, thus doing away with the through perch and still permitting the use of C-springs which are fastened to the back bar and top bed and from which the front end of the carriage body is suspended.

DOOR SPRING.—Josiah J. Mackey, South Brooklyn, N. Y.—This invention relates to a new and improved application of a spring to doors for the purpose of preventing the slamming of the same as they close.

MACHINE FOR STACKING HAY.—William Louden, Fairfield, Iowa.—This invention relates to a new and improved device for stacking hay whereby several important advantages are obtained over other devices hitherto devised for the purpose and a great saving in labor effected.

SPINDLE BOLSTER.—Francis A. Sterry, Canton, Mass.—This invention consists in forming an annular recess in the top part of the bolster in which is placed an absorbent for the oil and also in cutting slits through the central portion of the bolster through which the lubricating oil passes to the spindle.

HOLDER FOR HORSES.—John P. Reynolds, Mirabile, Mo.—The present invention relates to a holder for horses while being shod which holder is constructed in such a manner and so applied to the horse as to occasion no injury to him and without the least danger of accident or injury to the person operating upon or shoeing the horse.

TAG.—Frederick G. Sargent and Norman H. Bruce, Graniteville, Mass.—This invention consists in so preparing such surfaces of the said metal wire as are in contact and held by the folded over paper with a coating or covering of paint or fibrous or other material suitable to allow the said wire and card paper to become firmly united and joined together with the use of glue or gluten or other proper adhesive material, and also to enable the string around such wire or metal to be similarly fastened thereto.

LIFE PRESERVER.—D. H. Heyen, New York city,—This invention consists in combining an elastic air-tight tube with a broad substantial belt thereby effectually protecting the air tube from injury and rendering its application to the purpose intended much more easy than where air tubes or vessels are attached directly to the body of life preservers without such support.

COMBINATION OF AN ALARM AND LOCK.—Ezekiel Tracy, Kanzas City, Mo.—The present invention consists in so combining an alarm with a lock and arranging it in connection therewith that in unlocking the lock an alarm will be set free and sounded and thus the approach or entrance of burglars or other parties indicated to the occupants of the premises or room where the lock is applied.

PESSARY OR SUPPORT FOR THE UTERUS.—Mrs. Emiline T. Brigham, Philadelphia, Pa.—This invention consists in combining with a pessary which may be made of india-rubber or any other suitable material of the proper shape a coiled, spiral or other suitable-shaped spring support of a length sufficient to pass through and out of of the mouth of the vagina where at its outer endit is secured to the person by straps or other suitable fastening or holding means or devices. The object of the spring support is to hold the pessary against and about the mouth and neck of the uterus and thus to support the same, the spring shape causing it to produce an elastic support thereto and one most comfortable and easy to the wearer.

DOUGH KNEADING MACHINE.—Samuel Emmore, Stouchburgh, Pa.—This invention relates to a new machine for mixing and working dough, and consists in the use of an axle provided with stirrers; a screw thread is formed near one end of the axle, at one bearing, so that when it is revolved it will receive a combined intermittent, rotary and reciprocating motion.

HITCHING STRAP.—Thomas B. Chambers, Newtown, Pa.—This invention relates to a new manner of arranging the strap for hitching horses to posts, or other stationary devices, and consists in the use of a chain or strap, secured with its ends to the rings of the bridle. The hitching strap, which is fastened to the halter, is passed through this chain or strap, and is tied to the post.

TRANSMITTING AND CONVERTING MOTION.—Nathaniel Thompson, Farmington, Mich.—This invention relates to a new and improved means for transmitting and converting motion, a reciprocating motion being converted into a rotary one, and *vice versa*. The invention is an improvement on the double rack and pinion, which is an old and well known means for imperfectly effecting the result specified, but which by this improvement is made to operate in a satisfactory manner.

SCREEN-GUARD ATTACHMENT FOR CULTIVATOR PLOWS.—G. Brain, Springfield, Ohio.—This invention relates to a new and improved screen-guard attachment for cultivator plows, whereby clods of earth are prevented from being thrown upon the plants, and a greater or less quantity of fine earth thrown upon or around them, as may be required.

TRUCK.—Wm. P. F. Beggs, Philadelphia, Pa.—This invention relates to a new truck, which is so arranged that its front running gear can be turned short, although its platform is quite low. The invention consists in dividing the truck platform into two parts, of which one forms the main platform, resting upon the rear axle, while the other part is secured upon the fifth wheel, and holds the king-bolt, in the ordinary manner.

THILL COUPLING.—James P. Collins, Troy, N. Y.—This invention relates to a new and improved mode of securing thills to axles, whereby a very strong and durable connection is obtained, and one which will admit of the thills being very readily attached to and detached from the axle, all play and rattle and casual detachment of the thills avoided.

BALING PRESS.—Jackson Gorham, Bairdstown, Ga.—This invention relates to a new and improved baling press, of that class in which the platin is operated by means of levers arranged on the toggle principle. The invention consists in a modification of the construction of the arms of the levers, and also in a novel manner of attaching the rope of the levers to the operating or driving shaft.

MILL PICK.—Uzziel Stewart, Berlin, Wis.—This invention relates to a new and improved mill pick, of that class which are provided with an adjustable cutter. The invention consists in a novel construction of the pick and the manner of securing the cutter in the stock thereof, whereby the cutter may, with the greatest facility, be adjusted to compensate for wear.

LAMP CHIMNEY.—E. B. Requa, Jersey City, N. J.—This invention consists in a new and improved shape or form of the chimney, whereby the same is kept at an equal distance from the flame all around, and the usual contraction of the chimney above the flame avoided, whereby the chimney is subjected to a uniform degree of heat all around, and the liability to breakage greatly reduced.

CLOTHES WASHING MACHINE.—Eli Hunt, Shelburn, Ind.—This invention relates to a new and improved clothes washing machine, of that class which are provided with a rotary clothes receptacle. The invention consists in placing a rotary clothes receptacle, having a periphery composed of slats and provided internally with lifters; the clothes receptacle being placed within a suitable suds box and arranged in such a manner that the clothes, as the receptacle is rotated, will be passed through the suds, raised or lifted out therefrom, and allowed to drop from the top of the receptacle into the suds, to be again passed through it, which operation effectually cleanses the clothes.

CULTIVATOR.—Jared W. Sanford, Byron, Ill.—This invention relates to a new and improved cultivator, designed for general purposes, so as to be capable of perfoming all the various kinds of work now done by cultivators. The invention consists in a peculiar construction and arrangement of parts, wherby the end above specified, with a strong, ecomical and durable implement, is obtained.

MEDICATED BALSAM COMPOSITION.—L. F. Griffin, New York city.—This invention relates to a new and useful medical composition for curing sprains, bruises, swellings, sore throats, pains in the side and limbs, weakness of the back, ague in the face and breast, rheumatism, gout, neuralgia, and other affections.

GRADING AND EXCAVATING.—T. C. Hammond, Nicolaus, Cal.—This invention relates to an improved grading and excavating machine, and is intended for the grading of road beds for wagons and railroads, and for embankments to be used as dykes or levees for the reclamation of overflowed lands. It is also adapted to the excavation of open cuts for road beds, and to the excavation of canals and ditches for drainage, irrigation, and navigation purposes.

HOISTING DEVICE FOR TRUCKS.—Nathan Albertson, Plainfield, Ind.—This invention relates to a new and useful improvement in a device for raising logs, rocks, or other heavy objects, to be moved on a truck.

ATTACHMENT TO CARRIAGES.—Jackson Gorham, Bairdstown, Ga.—The present invention relates to an attachment to carriages, or more especially buggies, the object of which is to simplify the fastening of the traces and hold-back strap thereto, and the unfastening of the same therefrom, which result is satisfactorily accomplished.

PILL AND OTHER BOXES.—George H. Hawkins, New York city.—This invention has for its object to furnish an improved box for containing pills and other things, which shall be simple in construction, more reliable in use, and manufactured at less expense than the ordinary paper boxes now in use for such purposes.

FLOURING MACHINERY.—Martin Cosgro, Peoria, Ill.—This invention has for its object to improve the construction of flouring machinery so as to take out the fine bran and red particles from the flour while passing through the bolt.

PORTABLE DERRICK.—Chatham B. Wright, Belmont, Ohio.—This invention is designed to improve the construction of portable derricks, intended more particularly for stacking hay, so that they may be more convenient and effective in operation, the derrick revolving automatically to carry the hay over the stack and to return the empty fork to its former position.

ROTARY PUMP.—John Poppe, Greenpoint, N. Y.—This invention has for its object to furnish an improved rotary pump, designed especially for use on shipboard, but equally applicable for use in other places, and which shall be simple in construction, effective in operation, and not liable to get out of order.

SPRING BED BOTTOM.—D. G. Chapin, Galena, Ill.—This invention relates to a spring bed bottom, and consists in the means adopted for fastening the coil to the slats.

LOG WAGONS, CARTS, AND SLEDS.—G. S. Pigott, Central Station, West Va.—This invention relates to an improved log wagon, cart, or sled, and consists in an upright frame arranged on the axletree or roller of a common log wagon or cart or on the cross piece of a sled.

CRANE.—A. L. Batten, Topsham, Vt.—This invention relates to an improved crane specially designed for the purpose of taking sugar pans from the arch. It consists of a gallows crane set in a convenient position in the sugar factory, so that its arm may extend over the pans on the arch, and capable of being swung round to any position desired.

WHEEL.—Julius M. Bailey, Indianapolis, Ind.—This invention relates to an improvement in wheels, and consists in the employment of a wedge-shaped piece of metal keying between the felleys and secured to the tire by a screw bolt, by screwing on which the tire can be tightened on the rim of the wheel; also of a bed or socket wherein the end of the spoke can be stepped and a wedge driven home to tighten the spoke as it gets loose.

TEA KETTLE WITH A SWINGING LID.—C. C. & S. J. Hare, Louisville, Ky.—This invention relates to a new and useful device for attaching a swinging lid to a tea kettle, and consists in connecting the lid to the kettle by a pivot on one side with a curved slot in the lid fitted on the ear of the kettle, so that it shall be held in place by the ball and turn either way horizontally, for the purpose of opening and closing the kettle.

BLEACHING VEGETABLE OILS.—Theodore Leonhard, Paterson, N. J.—This invention relates to a new and improved method of treating linseed and other vegetable oils in the process of bleaching and preparing the same for paint and other purposes.

SAFETY POCKET AND CLASP.—Joseph Colton, New Orleans, La.—This invention relates to a new and useful device for protecting money, watches, and other articles of value from the depredations of pickpockets.

PORTFOLIO FOR NEWSPAPERS, PERIODICALS, MUSIC, ETC.—John C. Clarke, Jersey City, N. J.—This invention has for its object to furnish an improved portfolio, so constructed and arranged that the periodicals, etc., may be easily attached, securely held, and readily removed when desired.

LACING FOR BELTS.—David P. Davis, New York city.—The present invention relates to an improved lacing, more especially intended for machine belts and bands, and the lacing is composed of two parts of similar construction, with each part formed of a cross bar having a series of arms made of a hook shape at their outer ends, so that the parts can be interlocked together, the hooks of one part with the cross bar of the other, and thus if by their arms they are passed through suitable slits or openings made at the proper points in the belt at or near its ends, the two ends of the belt will thereby be secured or fastened together, and in such a manner as to bring the strain upon the lacing through the thickness of the belt, in lieu of in the direction of its length and that of the slits through which the arms to the fastener pass

WATER ELEVATOR.—H. Norris, Spencer, N. Y.—The water elevator embraced in the present invention consists of a reservoir placed at the bottom of a well or cistern, but with a space below sufficient for the water to pass into it, connecting with which reservoir is a tube extending up to the top of the well, where it is provided with a suitable discharge nozzle or spout. This reservoir is provided with a loose and movable bottom having in its center a valve plug of sufficient weight to fall through the bottom, which valve plug is provided with a rod or stem extending up through the center tube to its upper end, where through a chain or other line hung to it and passing around a pulley, turning in suitable supports, it is connected to and with a treadle lever.

MUSKETO NETS FOR WINDOW BLINDS.—George W. Miles, Philadelphia, Pa.—This invention relates to an improvement in the arrangement of a musketo net or gauze in connection with a window blind for the purpose of excluding musketoes, flies, and bugs without interfering with ventilation.

MACHINE FOR IRONING OR SMOOTHING CLOTHES, TEXTILE FABRICS, ETC.—C. R. Hoyt, East New York.—In the machine embraced by the present invention the clothes or fabrics to be ironed or smoothed are properly laid upon an endless traveling apron or belt, and by it carried to the ironing roller employed for smoothing the same, which roller is heated in any suitable manner, the frame in which the endless travelling apron is arranged and moves, being so hung that when desired in consequence of the seams in the garments or for any other reason, it can be depressed sufficiently to relieve such portions of the garments from the pressure of the ironing roller, without interfering, with the travel of the endless apron.

WOOL CARDING MACHINE.—S. C. Philbrick, Rockville, Conn.—This invention relates to improvements in the construction of card machinery and consists in applying additional rolls in connection with the first breaker cards and changing the position and run of the clothing in one of the feed rolls, whereby the machinery is rendered much more effective in operation.

ANIMAL EXTERMINATOR.—M. V. Nobles, Elmyra, N. Y.—This invention relates to a new and improved method of exterminating the animals or vermin which infest dwellings or buildings, or which pray upon vegetation, or which are in any manner a source of damage or annoyance to housekeepers, farmers, horticulturists, or others.

SASH SUPPORTER AND FASTENER.—James R. Hall, Georgetown, Ill.—The present invention consists in a simple and novel attachment to sash or window frames for the support and fastening of the sash thereon, at any desired point in its play or movement.

MARINE CLOCK.—A. J. Goodrich, Waterbury, Conn.—The present invention relates to the movement regulator of marine clocks, and it consists in making the same of one piece in lieu of three, as heretofore, the advantages of which are that it is more simple and more durable than the three part regulator; cannot get out of repair unless broken; is easily made, there being no holes to drill, no wire to be straightened and cut, or welding to be done.

EXHAUST FOR MILL STONES.—David Baird, Bloody Run, Pa.—In this invention the hot air, etc., is exhausted from around the mill stones, through a pipe in which a current of air is established by a fan.

MILL STONE DRESS.—A. N. Garland, West Charleston, Vt.—In this invention the furrows are made wide, shallow, and smooth, one edge being cut clear and sharp. Between the furrows, the surface near the center of the stone is smooth, and at other parts of the stone is cut like the face of a file. A new method of bosoming the stone is also used.

SNOW PLOW AND TRACK CLEARER.—Michael J. Cogin, and M. E. Russell, Mobile, Ala.—The object of this invention is to furnish a cheap and effective arrangement for clearing the track of snow and other similar obstructions, which can be attached to any car and adjusted, regulated, and operated by persons on the car.

CHIMNEY.—E. S. Phelps, Jr., Wyanet, Ill.—This invention relates to chimneys used in connection with stoves or furnaces, and consists in providing a new support and means of cleaning such chimneys.

CASTING METALLIC PIPES.—Benj. S. Benson, Baltimore, Md.—This invention consists in the use of an anchor of improved form and construction, which does not scratch or wear the mold.

YARD MEASURE.—Joseph Douglass, McConnellstown, Pa.—This yard stick has a handle at one end, and two projecting flanges, which mark the terminations of the measure, which may be a yard, a foot, or other distance, within the reach of the expanded arms.

PLOW.—S. T. Denise, Red Bank, N. J.—In this invention an inverted conical roller, in front of the mold board, and above the plow point, is rotated on its vertical axis by means of a small roller gearing with it, under the plow.

COMPOSITION FOR COVERING WOODEN BUILDINGS, BRIDGES, ETC.—Joseph Heckel, Decatur, Ill.—The composition which is the subject of this invention is designed to render wooden structures fire proof, and to protect them from the action of water and of the weather. It is also designed to be used as a paint, instead of white lead paint.

MILL SET.—T. C. Ball, Bellow Falls, Vt.—In this invention, which is designed for circular saw mills, a table slides back and forth under the head block, having a rail attached to its upper surface, which slides between two pins, projecting downward from the knee. The rail, being inclined at an angle of thirty or forty degrees from the perpendicular to the head block, causes the knees to advance or recede as the table moves in one direction or the other. Several of these tables are connected by a rod, which is operated by a novel reversing arrangment.

Answers to Correspondents.

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

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

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

J. I., of N. Y., asks what will remove nitric acid stains from the hands. Soap and Indian meal bran or pumice stone with rubbing.

J. H., of Mass., replies to the question of S. A. G., of Ind., in No. 22, current volume, how to procure a bright deposit in electro-plating, "A French authority says: Add to the silver bath sulphuret of carbon or an alkaline sulphuret which will cause the silver deposit to be as brilliant as if carefully burnished."

J. M. S., of Ky.—"What is the best recipe for painting a blackboard on a plastered wall?" Lampblack from which the grease has been burned mixed with benzine or turpentine will serve the purpose. Oil or Japan in the paint will give a gloss and make the board too smooth, neither of which is wanted. A blackboard should be of a dull lusterless black.

S. F. G., of Conn.—"What is the average indicated horse-power of the best locomotives, such as are employed on passenger trains; what do they weigh and what amount of water is evaporated per hour?". Passenger engines of about 33 tons weight of good design and in good order have run off from 750 to 800 I. H. P., and will boil off or evaporate about 8,000 lbs of water per hour.

W. W. McM., of Ala., says:—"I want some information in regard to the link motion. What is the rule, if any, to find the throw o the eccentric, the lap of valve over the ports, and the required travel of valve to cut off at any point in the stroke to as short as six inches?" The best plan in order to become practically acquainted with the properties and peculiarities of the link motion is to lay it down, valve and all, full size, on a drawing board. Or, better still, to make pasteboard or wooden models from which may be obtained any measurement desired.

D. W. S., of Robesonia Furnace, says.—"Our hot oven contains 50 pipes through which the blast is forced into the stack. The oven is heated to 600° and the blast is supposed, after passing through the 50 pipes, to leave the oven at the same temperature. Now will doubling the number of pipes without increasing the temperature of the oven increase the heat of the blast after passing through the oven?" If your blast, after passing through the 50 pipes of your oven is heated to 600°, which is also the temperature of the oven, no farther elevation of temperature of the air is possible except by increasing that of the oven; hence, if you increase the number of pipes nothing is gained. But we do not think the blast is as hot as the oven; its temperature may be raised by increasing the heating area over which it must pass before entering the furnace.

J. P. J., of Mass.—"Blow holes" in iron castings can be filled with a mixture of lead, 9; antimony, 3; and bismuth, 1. This resembles cast iron in color and expands in cooling.

H. S., of Ohio, asks how mill or other saws can be repaired and asks if silver solder will do. We have seen a large muley saw which was broken soldered with the following composition: Silver, 19 pennyweights; copper, 1; soft brass, 2, melted under a coat of charcoal dust.

O. A. F., of N. Y.—"Will 120 degrees fire test petroleum burn longer than that of 110°? Will an alcohol lamp placed in an air-tight vessel continue to burn until it burns out all the oxygen? How far will a common wooden pump draw water and have the water follow up the sucker (movable valve box), as fast as the lever was forced down measuring from the sucker to the surface of the water?" Oil of a high fire test is heavier than one of a lower grade and will burn longer in a lamp. . . An alcohol lamp burning in a close receiver will be extinguished before it exhausts all the oxygen. . . The pressure of the atmosphere at the sea level will raise a column of water about 33 feet; the kind of material in which the column is contained not affecting the result.

J. C. D., of N. H.—"How can I soften ivory to color and press it into molds?" In three ounces of nitric acid mixed with fifteen ounces of water put the ivory to soak. In three or four days the ivory will be soft.

W. S. P., of N. Y.—"Can you give me a recipe for coloring gut strings (as those used on a harp) black or red?" We know of no way of dyeing them without injury to the material. Probably a varnish or paint would serve the purpose.

J. H., of Mass., asks how he can deposit gold and procure a rich color without the brassy appearance which he at present obtains. If the plating is on silver and not very thick it will have a light color, as gold when thin is more or less transparent. A deposit of copper before the gold is deposited will give a deeper color; but probably if the gold deposit is thick enough there will be no trouble in producing the proper color without the copper.

C. S., of Minn., asks how he can tin a copper kettle from which the tin has been worn by use. He is so remote from any large place that he cannot get it done. Butt's "Tinman's Manual" says, "boil the copper vessel with a solution of stannate of potassa mixed with tin borings, or boil with tin filings and caustic alkali or cream of tartar. In a few minutes a layer of pure tin will be firmly attached."

I. V. J., of N. Y.—"Can you give me some idea of the method of generating carbonic acid gas such as is used for so-called soda water, with the proportions of material used and gas obtained?" Carbonic acid for soda water is commonly generated by mixing marble dust with an equal weight of sulphuric acid. Marble contains over 40 per cent of carbonic acid. A cubic foot of carbonic acid weighs two ounces.

Business and Personal.

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

Pattern Letters and Figures for inventors, etc., to put on patterns for castings, are made by Knight Brothers, Seneca Falls, N. Y.

Allen & Needles, 41 South Water street, Philadelphia, Manufacturers of Allen's Patent Lamina, for removing and preventing Scale in steam boilers.

For the Best Shingle Machine in use—will average 70 thousand in 11 hours, with one saw, or 140 thousand with two saws. Address Geo. Challoner, Omro, Wis.

Manufacturers of Auger-twisting Machines will please send circulars to Thos. P. Conard, West Grove, Pa.

All Parties having any article to sell through an agent, address, with circular, etc., Box 499 Oil City, Pa.

Toy Manufacturers will please send their address to Edward Fitzki, Quartermaster General's Office, Washington, D. C.

The Patentee of a new rule wishes to make arrangements for its manufacture. Rule and Scale Manufacturers will address Thomas Carter, 81 Third street, Louisville, Ky.

S. W. Gardiner, Newark, N. J., practical machinist, having a shop of good tools, desires to correspond with those who wish work in his line.

To Iron-pipe makers and Gas Fitters—send price lists of cast-iron socket pipes, dry and wet meters, service pipe, etc., to E. Moody, C. E., Omaha, Nebraska. Quantity required large.

Important to Manufacturers—see advertisement on inside page, of Broughton & Moore's valuable patents and tools for sale. Mr. Broughton has patented all his inventions through this office, therefore we know what his inventions are, and can recommend them as practical.—EDS.

Manufacturers of Circular Saws and Turbine Wheels please send circulars and price lists to Abner Hart, Guysboro', Nova Scotia.

A Young Man desires employment in some situation where a good Scientific and Mathematical education, with a knowledge of drafting, of the principles of mechanism, etc., would be of service. Address A. R., Webster, Mo.

H. N. Winans, 11 Wall st., New York, an authority on the subject of Incrustations, proposes to save 10 to 30 per cent of fuel and all the expense of cleaning boilers, by using his Boiler Powder, which removes any sized Scale, and prevents new formations. 12 years' use proves it no humbug.

Inventors and Mechanics interested in the wonderful process of reproducing oil paintings by mechanical means should order our "Journal for Popular Art," the first number of which will be mailed free. Address L. Prang & Co., Boston, Publishers of "Prang's American Chromos."

EXTENSION NOTICES.

A. M. Sawyer, of Athol, Mass., having petitioned for the extension of a patent granted to him the 7th day of March, 1854, for an improvement in machines for splitting rattans, for seven years from the expiration of said patent, which takes place on the 7th day of March, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 17th day of February next.

Warren Gale, of Peekskill, N. Y., having petitioned for the extension of patent granted to them the 7th day of March, 1854, for an improvement in the gage of straw cutters, for seven years from the expiration of said patent which takes place on the 7th day of March, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 17th day February next.

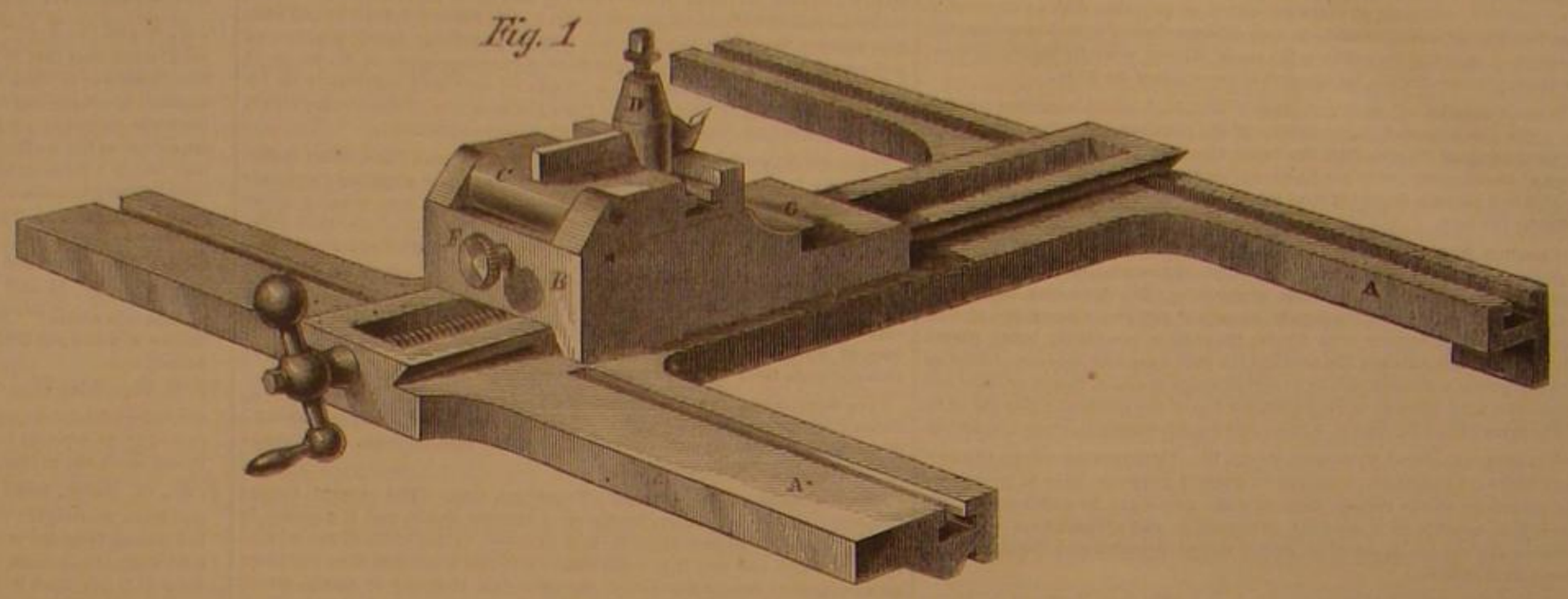
Device for Lathe Carriages.

Various devices have been adopted for the purpose of adjusting the tool of a slide lathe, but they have been all more or less defective, and their use has been in most cases abandoned.

The most popular form still in existence is the weighted rest, but the principle is in this erroneous, as steadiness and stiffness must be sacrificed; for weight is all that can be relied upon for keeping the carriage snugly in position on the bed, and in cases where interstices or irregularities occur in turning, the result is anything but satisfactory. Another point which can be urged against this arrangement is the inordinate wear of the bed occasioned by the necessarily augmented weight. This would not be productive of so much evil were it to extend the full length of the bed, but in tools where short work has been done for even a limited time, a very material hollow is perceivable between the sliding points of the carriage, which is ruinous to the accuracy of the machine. These disadvantages have proved themselves so well founded, that numerous leading manufacturers have entirely relinquished the use of a weighted carriage, and now use merely annular wedges, which certainly cannot be charged with the leading defects of the method just commented upon; but what they gain in this respect they lose in awkwardness of their manipulation, and it is only by a series of trials involving time that the desired adjustment can be attained at all.

Now, the device which our engravings represent, seems to preëminently combine all the most desired features; its solidity is not in the least degree impaired by complete control and fine adjustment of the tool point, even when in operation, and it possesses in itself a novelty, in its adaptedness to cutting screws, of so much merit that this alone is sufficient to recommend it. When cutting screws by means of the ordinary rest, the operator is obliged to draw back the rest when the lathe is reversed, in order that the thread or tool may not be injured. Each time the cut is recommenced the same formula must be observed, which, aside from being inconvenient, is disadvantageous, as the accuracy of the feed is interfered with by the alternating movement of the tool to and from the work. The "Improved Rest" is adjusted to the carriage, A, in the ordinary way, B, is of box form within which is fitted the wedge, E, and block, C, wherein the tool post, D, is inserted. C swings at the point, H, and rests upon the wedge, E, which is in turn controlled by the screw, F. G is a guard to keep the dirt from getting under the wedge. Now, it will be seen that when the elevation of the point of the tool, I, is necessary, a turn of the screw, F, pushes the wedge under, C, and produces the required effect; when depression of the tool point is desired, a withdrawal of the wedge by the same means accomplishes it. When it becomes necessary to reverse the lathe, as in cutting screws, it is obvious that the tool will ride on the work quite lightly, swinging on the pin, H (or it may be relieved by hand to the same end), but immediately on recommencing cutting, the tool will engage solidly, and thus only one movement of the feed is requisite, and that always toward the work between the centers.

Fig. 1



THE BURDGE PATENT IMPROVED TOOL REST.

This invention was patented by Jonathan E. Burdge, August 13, 1867, and the sole right has been purchased by the Niles Tool Works, of Cincinnati, O., who are prepared to furnish the rests, or furnish tools of their own manufacture, with the patent rest attached.

Improved Spectroscope.

Professor Osborn, of Lafayette College, Easton, Pa., has made improvements in the spectroscope, by which it may be readily applied to a variety of practical purposes, especially in metallurgical operations. In a recent letter to us he says:

"The instrument complete is so arranged that the observer reads the degree on the scale by the actual light which he is analyzing. The very light which comprises, in its flame, the vaporized metal as lime, iron, chromium, titanium, sodium, etc., discloses to the observer in the spectral form its own nature, not only, but often to a great degree, the approximate quantities found in the original ore or even in the coal used, or from the wasting brick of the furnace. Nothing can exceed the beauty of the spectral forms which suddenly appear and disappear in the otherwise darkened tube, as the observer stands at the 'tunnel head' of the furnace, watching as it were, the spectral secrets of that terrible flame which pours forth from the stack, especially when, after the 'cast' and consequent cessation of the blast, that blast is again turned on.

"The bright yellow bar of sodium is almost always present during examination of all flames resulting from the use of any and all forms of anthracite in the furnace and forge, or from decomposing soda feldspars.

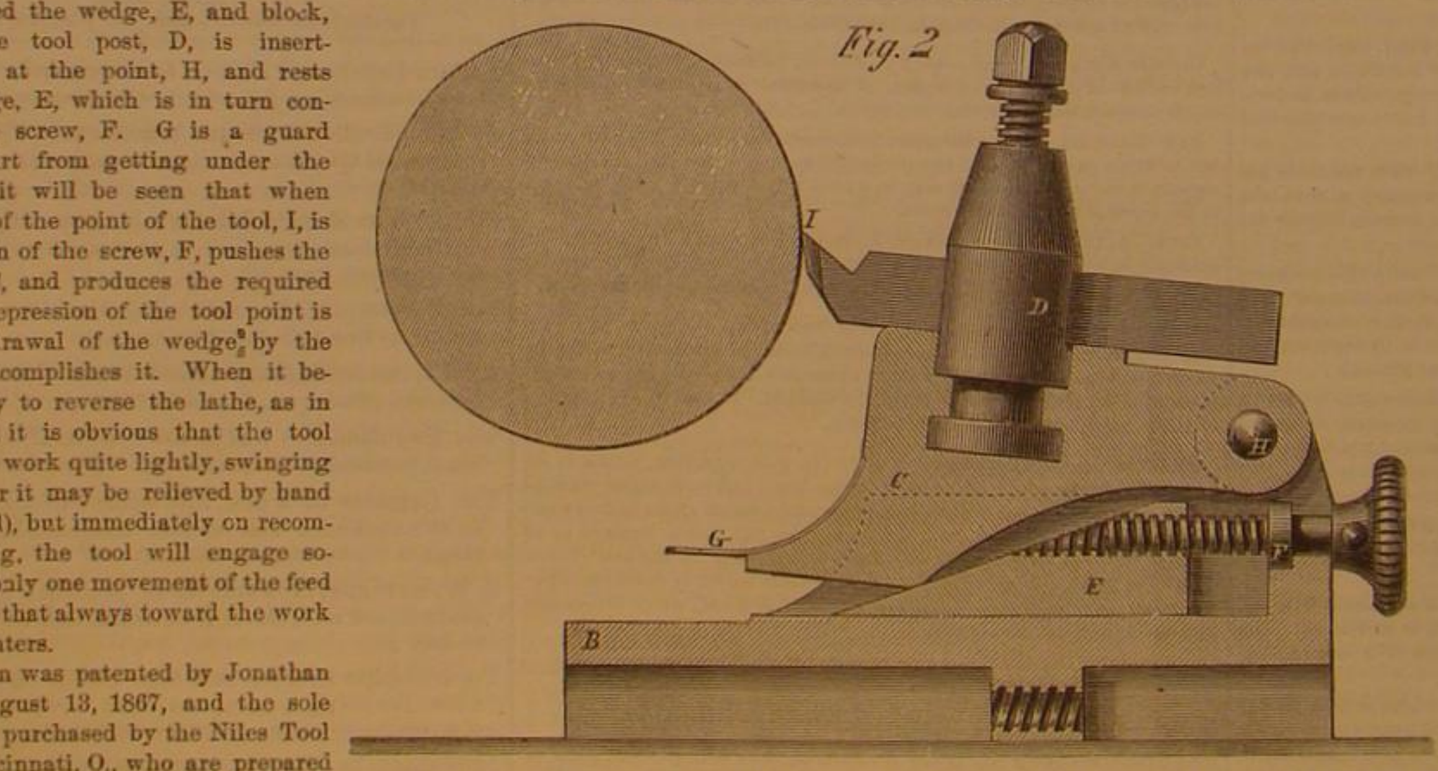
"But one of the most striking facts in my examinations occurred at our last analysis of a flame from a reheating furnace on the Lehigh, at the wire works of Stuart & Co. The workmen held partly out a bar of intensely heated iron on the hearth of the furnace, when, at rapid intervals, the dark lines which are seen in the solar spectrum appeared faintly, but certainly, flitting over the spectrum of the fierce flame by which the intensely heated iron was enveloped.

"An instrument, of a circular form, is in course of construction, under my direction, for the easy examination of these flames, and which may be used at any time and at considerable distances, and I am hoping that such shall be its sensitiveness that the furnace master may sit in his room and know much of the efficiency and value of the operations proceeding at the furnace, by its use. I am situated on a hill, and by means of my instrument, placed upon my dinner table, I can get a beautiful spectrum from a reheating furnace situated not much less than a half mile from my instrument, and am able to detect the sodium in the coal, or from the decomposed fire brick, and also any lime, potash, etc., which proceeds from the furnace mouth. I have no doubt that some exceedingly important uses may be made of this discovery of the spectroscope in the line of metallurgical operations."

On the Pressure of Steam at High Temperatures.

Prof. Klingenfeld has lately succeeded in finding a formula for the calculation of the expansive energy of heated water:

Fig. 2



as the same is quite simple and short, and the differences between the results obtained by it and the best known experiments are quite insignificant, we hope its publication will will not be out of place. It is the following:

$$t = 180 \log. (4+6a)+32.$$

t expresses the temperature, a the number of atmospheres, and log. Brigg's logarithms.

In the following table we have placed the calculation by this formula side by side with the results of M. Regnault's experiments, quoted from the excellent Principles of Physics of Prof. Benjamin Silliman.

PRESSURE. Atmospheres.	TEMPERATURE FAH. OBSERVED. Degrees.	TEMPERATURE FAH. CALCULATED. Degrees.	DIFFERENCE. Degrees.
1	212	212	..
2	249·5	248·7	+0·8
3	273·3	273·6	−0·3
4	291·2	292·4	−1·2
5	306·	307·5	−1·5
6	318·2	320·3	−2.1
7	329·6	332·1	−2·5
8	339·5	348·8	−1·3
9	348·4	349·3	−0·9
10	356·6	357·	−0·4

Example.—Required, the temperature to produce a pressure of 67 pounds per square inch (the atmosphere taken at 15 lbs.)

$t = 180 \log. (\frac{154}{5}) + 32$ (log. $(4+\frac{6\times67}{15})$, being equal to log. $(\frac{154}{5})$.

$$\log. \frac{154}{5} = 1{\cdot}4885.$$

$t = (180 \times 1{\cdot}4885) + 32 = 299{\cdot}93°$, the temperature required.

The National, Anti-Monopoly, Cheap Freight Railway League.

This is the somewhat pretentious title of an association the object of which is to construct railroads for the use and benefit of the public, with a view to the ultimate adoption of the system on all roads. The idea is, that our railroads, as at present conducted, are doing but a tithe of the work they are calculated for; that the cheap transportation of freight from point of production to point of consumption is a desideratum to all classes; that the proper development of our immense agricultural, mineral, and manufacturing resources demands cheap and rapid means of intercommunication, and that open competition and equal advantages are better than close monopolies.

The intention of the association is to construct several new lines of railroads connecting the South and West with the East, making, in the aggregate, about 4,000 miles of road, exclusive of branches. On these roads trains for freight are to be run—by any individuals or companies who may wish to avail themselves of the privilege by paying a certain toll—at a certain rate of speed, thus keeping the road in continual use. Once established on one independent line, its advantages and benefits would probably insure its adoption on every road in the country.

We have repeatedly referred to this project in favorable terms, but we deem it of too great importance to be allowed to rest. The whole country is interested in this matter. Not unfrequently the cost of transporting articles of prime necessity from their locality of production to the place of consumption is greater than the first value. Every means that can cheapen the price of food, fuel, etc., is eminently worthy attention, and no means is more direct than the diminution in the cost of transportation

We agree with the *American Railroad Journal*, which says:—

"Few persons, at sight, comprehend the immense effect of an improved system for the rapid and cheap handling of the agri-agricultural, mining, and manufacturing resources of the country. It was stated by an intelligent farmer of the West, a few days since, that the 'Cheap Freight Railway System,' if accomplished, would add three-fourths to the average net profits of agriculture, after deducting the cost of production, to the whole country west of Utica. It has been clearly pointed out that Pennsylvania, in consequence of expensive freights, is suffering under a yearly deficiency of production of more than one hundred millions as compared with some other States, and that Ohio and the West generally, stand in nearly the same category, while the Southern States exhibit a still more meager production. It was well remarked by an experienced railway financier of England, lately, in this country, that 'the great West is strangled by illiberal railway policy, while the South is starved,' and he concludes that 'cheap freights and very numerous trains are the remedy.'"

As to the feasibility of the plan we have no doubts; the great difficulty will be in convincing railroad corporations and their stockholders that equal rights without monopoly will be in the end more profitable than the present system. Their prejudices, however, would rapidly disappear with the first successful development of the new plan.

Feat of a File Maker.—A workman in one of the Sheffield Works has cut a file 19 inches long, 8 inches wide, and 1 inch thick. The file is rough on one side and bastard-cut on the other. The chisel used in cutting it was 12 inches in length so that instead of being over-cut and up-cut in rows one row sufficed for both cuts.

M. Paul Morin, the chemist in charge of the Aluminum Bronze Works near Paris, asserts that the melted alloy when poured into the mold is transparent. Mr. T. Sterry Hunt hearing of the assertion witnessed the operation and states that the appearance of the molten stream seemed to corroborate the statement.

Scientific American.

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VOL. XVII., No. 25....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, DECEMBER 21, 1867.

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CLOSING OF THE VOLUME---INDEX AND TITLE PAGE.

We had at one time the impression that only a portion of our readers desired the index and frontispiece which are published at the close of each volume of the SCIENTIFIC AMERICAN. Acting on this idea, at the close of Vol. XVI., we notified our readers that the index and title page would be sent only when applied for. The applications were so numerous and general that we have concluded to print as a part of the next or closing number of Vol. XVII., the full index and title page. We were gratified to learn by the immense number of applications for the index after the close of last volume, that so large a proportion of our subscribers preserved their numbers for binding.

THE "SCIENTIFIC AMERICAN."---COMMENCEMENT OF A NEW VOLUME.

With the issue of the next number, Volume XVII. of the SCIENTIFIC AMERICAN—New Series—will close. One year ago we enlarged the paper—nearly doubling its size—at a heavy expense, but without raising the price of subscription, confident that our endeavors to improve and beautify the paper, and benefit our readers, would be appreciated by them and result in a corresponding increase of the number of our subscribers. We were not mistaken, and the SCIENTIFIC AMERICAN continues to be, as for nearly a quarter of a century it has been, the best and most highly valued journal devoted to Science and Mechanics in the country. Its editorials are widely copied, both here and abroad; its published correspondence brings practical men, throughout the country and world, *en rapport* with each other; its illustrations and descriptions of new inventions make the mechanic acquainted with the improvements of others, and serve as valuable guides to the inventor; its replies to correspondents contains weekly a vast fund of valuable information on almost every practical subject, and its department for the young conveys knowledge which is of present interest, and may be of future benefit. In addition to these departments, our Editorial Summary gives notices of mechanical novelties and recent scientific discoveries, culled with great care from various sources, not only from our domestic and English exchanges, but translated from French and German periodicals expressly for our columns. Our Mining, Manufacturing and Railway Items present from week to week a brief but comprehensive *resumé* of the events and discoveries in these departments. The list of foreign patents taken out by Americans, which is prepared for our columns weekly, and the complete official list of United States patents are of great value to the inventor, manufacturer and mechanic.

What the SCIENTIFIC AMERICAN has been the past year it will be hereafter, except that no efforts will be spared to improve in every department as opportunity offers and the progress of the times demands. Our aim is to encourage honest and persistent endeavor, to give counsel and advice where needed, to state our sincere opinion when requested, to defend the mechanic from unprincipled charlatans by exposing the fallacy of their pretensions, and to contribute, as much as lies in our power, to the assistance of inventors. The opinions of correspondents are respectfully considered, and their productions published when they possess such merit as makes them valuable to others. We shall not hesitate to expose the humbugs of pretenders, while we shall be no less earnest in the encouragement of honest seekers after truth.

IMPROVEMENTS IN STEAM ENGINES SINCE THE TIME OF WATT.

So long as steam remains a mechanical power adapted to the uses of man, so long will the fame of James Watt endure as the grand improver of the mechanism through which that agent works. Still, it may be doubted whether the practice of ascribing all the benefits of the steam engine, as at present used, to the genius of Watt, and thus robbing later inventors of the credit due them, is borne out by the facts. The steam engine of the present day is a much greater advance on the best, constructed under Watt's supervision and from his plans, than his was on the crude attempts of Savary. Within the memory of living mechanics, the steam engine has undergone such a complete transformation, not only in outward form, but internal construction, as to be an almost entirely different machine. A stationary engine of thirty years ago would be a curiosity to our young engineers. The length of stroke as compared with diameter of the cylinder was enormous; the fly wheel was only a fly wheel, never a pulley; the valves were unbalanced; few engines "cut off" or used steam expansively, and the governor merely checked the inlet of steam to the chest, but did not govern the valves. All these important points have been the subject of comparatively recent improvements.

On the best engines now built the steam is used expansively, in one cylinder, by means of cut-off valves, and the action of the valves is governed directly and absolutely by the regulator or governor; so that the amount of steam admitted to act upon the cylinder piston is adjusted exactly or nearly so, to the work required of the engine—a most important, if not a radical, improvement. The immense pressure sustained by the old-fashioned valves, which had to be moved by purely mechanical force under a load denoted by the pressure of steam per square inch multiplied by the area of the valve, and against the immense friction of the surfaces of the valve face and seat, is now almost wholly annihilated by improvements in this part of the machine. The improved packings for piston and stuffing boxes, while diminishing friction in these parts, have added immensely to their efficiency, and in connection with the use of live steam cylinder jackets, have insured a great saving of steam, and, consequently, fuel. The condenser for low-pressure engines has been as much improved by comparatively modern inventions as any other part.

It is evident that Watt had an idea of these possibilities. For instance, he conceived the project of using steam expansively in one cylinder, but it was left to later inventors to perfect it. It would be unjust to those mechanics who have for the past twenty-five years made steam and the steam engine their study, to deprive them of the credit due them for increasing the efficiency of this great mechanical motor. James Watt was a great inventor, but he did not exhaust the possibilities of the steam engine by his inventions.

PETROLEUM FOR STEAMSHIP BOILERS---THE RPEORT OF THE NAVY DEPARTMENT.

We have frequently alluded to the project of substituting petroleum for coal as a fuel for generating steam, and on pages 137 and 153, current volume, we considered the matter in two articles in which we treated on the comparative heating powers of petroleum and coal; their relative values as heat producers; relative cost; relative space occupied on board ship, and the dangers, real or supposed, of storing petroleum on board vessels. In subsequent articles we also considered the life of the petroleum apparatus as compared with the coal furnace, and the difference in the cost of labor. From these facts, fortified by figures which were eminently reliable, but which were as favorable as possible to petroleum, we deduced the conclusion that this substance could not safely and economically usurp the place of coal. This conclusion is fully sustained by the report of the Secretary of the Navy who says:

The act approved April 17, 1866, appropriated five thousand dollars for testing the use of petroleum as a fuel for marine boilers. An elaborate series of experiments has been made at the New York and Boston Navy Yards. The conclusion arrived at is that convenience, comfort, health, and safety are against the use of petroleum in steam vessels, and that the only advantage thus far shown is a not very important reduction in bulk and weight of fuel carried.

It would seem that this declaration is sufficiently explicit to satisfy the most sanguine advocates of petroleum as a substitute for coal. We have had no personal nor pecuniary interest in this question, our only desire being to present the plain facts without wishing to do an injury to any experimenters. It may be that some cheaper material than coal, less bulky, and more easily managed, may in the future be discovered, but we have yet to see the proofs that petroleum is the substance destined to supersede coal.

PATENTS.

The rapid increase during late years in the number of patents annually granted for new inventions, is something astonishing. Statistics in an old Patent Office Report at hand show that, during the first fifty years after the establishment of the Office, the number of patents issued for that entire period fell far below every annual issue for some years past, and a comparison of the list of claims published in the earlier numbers of the SCIENTIFIC AMERICAN, with the lengthy record which, week after week, now appear in our columns, is proof conclusive of the growth of business in this department.

The report of Secretary Browning for the year ending October 1st shows that 2,500 more applications were made this year than last, and over 5,000 more than on any previous year. The whole number of applications was 16,547. Of these, 12,879 were allowed, and 11,655 have been issued—an increase of about 3,000 over last year's issue. During the same time, 3,486 caveats were filed, 96 applications for extensions were received, and 82 extensions were granted

The Patent Office receipts for the year were $611,910.61, the expenditures $553,599.98, leaving a balance of 53,310.63, which, added to the balance on hand, makes the amount now in the treasury to the credit of the Patent Fund, $286,607.89.

WOOD ENGRAVINGS---HOW THEY ARE MADE.

The art of engraving is one of the oldest, and its origin is lost in the mists of antiquity. Probably it was cotemporaneous with the origin of written language, and may have preceded it in point of time. A variety of substances are employed to receive the work of the engraver, but wood is now more extensively used than any other; and wood engraving has been brought to such perfection as to rival in delicacy of finish and richness of effect the best efforts of engravers on metals. Wood engraving is used entirely for the illustrations in periodicals and mainly for those in books, although occasionally specimens of steel plate engraving are inserted in very elegant and costly volumes. The woods employed are box, pear, apple, beach, maple, mahogany, and pine, of which box is infinitely the best. The large illuminated posters used by exhibitions are coarse engravings on pine or some other common wood, cut with the grain. Of course, no attempt at finish or elegance can be very successful with such material, yet the effect, when combined with judgment in the printing, is frequently quite imposing.

Box wood, on which the best engravings are cut, is the product of a shrubby evergreen, a dwarf variety of which is in common use here as borders to flower beds and gravel walks. The tree variety seldom passes in this country beyond the size to which the term shrub rather than tree could be properly applied, although we have seen one specimen at least fifteen feet high, the stem or trunk of which was over seven inches in diameter. In southern Europe, however, this size and even larger is quite common. The name box—Latin *buxus*—is from a Greek word which means also cup or vase, denoting its use in former times for the construction of drinking vessels. It is still largely employed for the manufacture of ornamental boxes and other specimens of the turner's art. But its principal value is its adaptability for engraving.

Large quantities are sent from Spain, the Levant, and the island of Majorca. A considerable quantity is brought also from Turkey. The wood is yellow in color, hard, heavy, very close and even grained, and susceptible of a high polish. Its specific gravity varies from 0·971 to 1·328. If the latter is taken as a standard, the specific gravity of box wood exceeds that of any other wood known to the arts, as ebony has a specific gravity of only 1·259, and guaiac of 1·302. The wood is prepared for use by steeping large blocks in water for 24 hours, after which it is boiled in water and then dried in sand or ashes.

It is brought to this country in logs or blocks, denuded of its bark, and for engraving purposes is sawed across the grain, squared, and planed to a true surface on each face. It is seldom obtained in pieces six inches square, although we have seen one specimen perfectly sound, and of excellent quality, which squared to seven-and-one-eighth inches. Most blocks, however, of such dimensions on which engravings are cut, are composed of from three to eight pieces, joined and secured in the most exact manner. The engravings prepared for the SCIENTIFIC AMERICAN are invariably cut on box wood, and not nfrequently one of the blocks contains eight or ten pieces.

The blocks when ready for the designer or artist are exactly the thickness or hight of the ordinary type—a shade less than fifteen-sixteenths of an inch, or, more correctly, twenty-nine thirty-seconds of an inch. The upper surface, which receives the design, is finished very smoothly, and preparatory to receiving the drawing is coated with flake white—that scraped from the faces of enameled cards being generally used. The artist transfers the outline of the design to the face of the block by means of a transparent paper on which the design is drawn. The drawing and shading is made by lead pencils of different qualities and a camel's hair pencil charged with sepia or India ink. When done by an artistic hand the drawings are very beautiful, presenting an elegance of appearance very difficult to reproduce on paper from the engraved block.

Although the engraver must follow the lines and shadings of the designer, the former, to be successful, must possess great skill, acquired only by practice, and use considerable judgment in carrying out the artist's ideas. The excellence of the engravings published in this journal testify to the talent of our principal artist, Mr. F. Louis Seitz, and our engraver, Mr. Richard Ten Eyck.

The engraving is done in the same manner and with tools similar to those employed in engraving on metals. Most of it is done entirely by hand, although sectional views and those portions which consist only of unshaded parallel lines are engraved by a simple machine called a "ruling machine."

During the progress of the work of designing and engraving, the blocks must be defended from damp atmosphere and the sun's rays. If the design is to be reproduced indefinitely it is usually considered best to make from the block one or more electrotypes, which, being of type metal coated with copper and mounted on wood, will last for years. In wood engraving the "whites" are cut away from the surface, leaving those parts which are to receive the ink and produce the impression, in relief. But occasionally the reverse course is adopted and the figures or letters are sunk into the wood and the ground is left, producing a black ground with white

figures. This is a method employed for producing outline sketches at but little cost. When used in the pages of a book or newspaper the engraved blocks are placed in the form and locked with the type. Considerable experience is required in printing these illustrated pages. After a form, the pages of which consist wholly of type, is once secured on the bed of a press it is ready to give its impression to the paper; but where the pages contain engravings they must be "worked up" with "underlays" or "overlays" until the proper effect is produced. Underlays are films of paper pasted to the bottom of the block to raise one portion of the engraving relatively higher than the others, and "overlays" are similar devices placed on the "blanket" between which and the form the sheet to be printed is passed. Although the engraver may have exercised the utmost skill, yet the proper effect of his work is brought out by the pressman. The adjustment of the illustrated forms of the SCIENTIFIC AMERICAN sometimes requires the careful and judicious labor of the pressman four or five hours.

From the foregoing it will be seen that Xylography or Wood Engraving is an art requiring talent, skill, and excellent judgment for its successful prosecution. It has attained a high degree of perfection in this country, and until some cheaper and superior method of reproducing designs is introduced, will remain an efficient means of intellectual education and amusement.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING DECEMBER 3, 1867.

Reported Officially for the Scientific American

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71,566.—LAMP.—J. B. Alexander, Washington, D. C.

I claim the single plate, A, with the turned edegs, C and C', and the bent stop piece, D, in combination with the wick tube, B, the notches, E and E', the bevelled friction collars, G and G', the axle, F, the spring, S and S', and the burner, I, substantially as described and for the purpose set forth.

Also the bevelled friction collars, G and G', in combination with the axle, F, the plate, A, the wick tube, B, the spring, S and S', the notches, E and E', and the slots, K and K', when arranged together and with regard to the adjustment of wicks in oil-burning lamps.

71,567.—DIE FOR SWAGING AND FORMING BUNTER SHAPES.—A. E. Barnard, Akron, Ohio.

I claim the herein described swages for forging bunting irons or shapes, when the same are operated by a tilting or power hammer, in the manner substantially as set forth.

71,568.—MACHINE FOR CARVING WOOD.—August Basse, Quincy, Ill.

I claim conveying the motion from the tracer to the cutter by means of the slotted levers, Q and R1, and link, R, which may be adjusted to cut the figure carved the same hight of the pattern, or either higher or lower than the pattern.

Also constructing the coupling, P2, with a spring to press the cutter shaft against the traverse rod, substantially as described for the purposes set forth.

Also constructing the couplings, Q1 and S2, with clamping nuts, as described, so that when the tracer and cutter are set or adjusted the nuts may be clamped upon the screws to prevent them from turning.

71,569.—STEAM BLOWER.—John A. Bassett and Oliver C. Smith, Salem, Mass.

We claim the arrangement of the several parts herein shown and described, or their equivalents, whereby is produced a blast of commingled air and steam, the air being previously compressed by the fans, C, and injected by the steam jets, D, the whole operating together in the manner and for the purpose as herein described and set forth.

71,570.—WASHING MACHINE.—Mikel Beck, Lake View, Ill.

I claim the gear, consisting of the grooved plate, A, pin or shaft, B, provided with plate, b, and rollers, d d, in combination with the lid or cover, F, of the box, the whole arranged and operating substantially as herein set forth.

The spider, C, provided with pins, G G, in combination with the above-described gear, substantially as set forth.

71,571.—OVEN FOR COOLING WINDOW GLASS.—Desire Bievez, Haine St. Pierre, Belgium.

I claim the lifting frames, constructed, arranged and operating substantially as and for the purpose herein specified.

Also the movable longitudinal bars for moving the glass sheets or plates along, substantially as herein set forth in combination with the lifting frames.

Also the grooved oven bed for the reception of the transverse bars of the lifting frame and the longitudinal moving bars, substantially as herein specified.

71,572.—CORN PLANTER.—Orson Billings Lagrange, Ohio, assignor to himself, Russell H. Penfield and Homer Penfield.

I claim the blade, A, with its flanges, a, in combination with the blade, B, having flanges, f, and spring, D, substantially as described and set forth.

71,573.—WIRE FIGURE.—Wannibald R. Boerner, Chicago, Ill., assignor to himself and Carl R. Boerner.

I claim, 1st, A wire figure composed of the removable waist and lower part without a central support or pedestal, substantially as and for the purpose set forth.

2d, The removable waist, D, provided with the wire, A, in combination with the lower part, F, provided with the strong metallic hoops, B and E, as and for the purposes specified.

71,574.—CARRIAGE SPRING.—Priseus E. Bomboy, Espy, Pa.

I claim, in the construction of springs for carriages and other like purposes, the combination of the spiral springs, B, with the flat springs, C, one end of the latter being connected to the axle tree, the other to the shaft, substantially as and for the purpose described.

71,575.—HORSE HAY FORK.—Lester L. Bond, Chicago, Ill.

I claim the prongs, E, pivoted to the bar, B, and connected by links, K, to the bar, A, in combination with the lever, D, pivoted to the bar, A, connected by link, c, to the bar, B, when said parts are arranged for joint operation, substantially as herein described.

71,576.—RUNNER FOR WHEELED VEHICLES.—Ferdinand T. L. Boyle, New York city.

I claim, 1st, Connecting a runner to the wheel of any vehicle by means of a central clamp or fastening embracing the bottom of the wheel and perpendicular under the center of the wheel or its axle and of a front and rear brace located substantially as described extending from the runner to the wheel and inclined inward toward the axle, substantially as and for the purposes set forth.

2d, In combination with such a runner so constructed the arrangement of the flexible chain, d, and tightening screw, f, and of the movable braces, g g, and brace rod, o, either separately or in combination for binding and holding the wheel securely to the runner, for the purposes set forth.

3d, In combination with such runner the construction and arrangement of the hinged brace, g, and brace rod, j', and chain clamps, as shown in Figs. 18 and 19, substantially as and for the purposes set forth.

4th, In combination with such a runner the arrangement of the fixed clamps and braces, B B1 B2, Plate II, and the cross pieces, E, for securing the wheel and runner together.

5th, In combination with such runner the arrangement of the adjustable bed plate or bolster, D, or its equivalent, to adapt the length of the front and rear braces to wheels of different diameters, for the purposes set forth.

6th, The construction of the bed plate, K, for taking the wheel, having a surface formed of a single concave or by the intersection of two concaves as described so as to secure two or more distinct and independent points of bearing or contact for the wheels, for the purposes set forth.

7th, In combination with such a runner the use and arrangement of the races, l m m', for connecting the runner and axle to protect the runner against side thrust or strain.

8th, Forming the side braces, m m' or H' H', with a hook or shoulder at either or both ends, substantially as shown in Figs. 4 6 7, Plate II, for the purposes set forth.

71,577.—HAY RAKER OR LOADER.—William F. Brown, Washington, D. C., and J. Nottingham Smith, Jersey City, N. J.

We claim the conveying passage inclosed between the slats, L L and I I, and narrowing in the upper portion thereof in combination with the gathering rake teeth, G G, and the elevating teeth, H H, revolving with the driving wheels whether the under slats, I I, are fixed or revolve in that portion encircling the axle, substantially as and for the purpose herein specified.

71,578.—GLASS MAKER'S POT.—W. H. Capewell, Westville, N. J.

I claim inclosing the waist, a, and bottom of the pot, A, within a cup, B, when constructed and arranged as and for the purpose herein specified and described.

71,579.—HORSE RAKE.—Samuel Carpenter, Brookfield, Ill.

I claim the combination of the bars, A B, uprights, a, teeth, F, arms, C C, and connecting bars, D D, provided with a series of holes, e, all arranged and operating substantially in the manner and for the purposes specified and set forth.

71,580.—BUFFER AND DRAW BAR FOR RAILROAD CARS.—Edward L. Caum, Patterson, Pa.

I claim the combination of the yielding bumpers, D D, with the sliding rods, A A, when said rods are connected by the plates, C C, and employed in connection with the plates, F F, and bolts or draw bars, E E, and adjusted within the car frame, and arranged to operate substantially as and for the purpose set forth.

71,581.—CULTIVATOR TEETH.—Norman Chappell (assignor to Henry E. Chappell), Lima, N. Y.

I claim, 1st, The arrangement in cultivator teeth of the plate, P, and shares, w, substantially in the manner and for the purposes herein shown and described.

2d, The combination of the shares, w, and separators, s, substantially in the manner herein described and for the purposes set forth.

71,582.—COW-MILKING MACHINE.—Isaac Cook, Philadelphia, Pa.

I claim, 1st, An air pump so combined with a milking machine that the milk will be drawn into the receiver or bucket without passing into or through the said pump.

2d, Giving a raising and lowering motion to the teat cups while milking, substantially for the purpose shown.

3d, A stop cock so combined with a cow milker and so arranged relative to the teat cups that the operation of milking may be discontinued on all the teats at one and the same time.

4th, Bevelling or thinning the upper ends of the teat cups either inside or outside, as shown and described.

71,583.—ROOF TILE.—William Cranage, Cleveland, Ohio.

I claim tiles constructed with offsets, B C, at the sides and ends forming rabbeting joints in laying said tile as specified, being a new article of manufacture.

71,584.—EYE GLASS.—James J. Crispin, Providence, R. I.

I claim the combination of a clasp, C, spring, A, and frame, B, substantially as described.

2d, Also the combination of the spring, A, spiral spring, E, and frame, B, substantially as described.

71,585.—PAINT.—Hiram Curtis, New York city, assignor to Edward P. Curtis and Stephen D. Law.

I claim, 1st, Subjecting marble dust or finely pulverized marble, when used in the composition or manufacture of paint and for similar purposes to the action of water, substantially as and for the purposes set forth.

2d, The use of marble dust when so treated or prepared in the manufacture of kalsomine or covering for walls, ceilings, etc.

71,586.—DEVICE FOR GRINDING CUTLERY.—Jonas P. Curtiss, New Britain, Conn.

I claim a device for forming and finishing the edges of knives, etc., substantially as described.

71,587.—BUILDING.—William Damerel, Brooklyn, N. Y.

I claim, 1st, The combination, in a face wall, of a lap joint, with bevelled articulations, substantially as described.

2d, In a face wall the combination with the bevelled joint at the top of flange, c, of the rounded joint on the outer side of the wall, substantially as shown.

3d, The combination with the bevelled joint on the top of flange, c, of the square outer joint shown on the upper block in Fig. 2, substantially as described.

71,588.—SCALES.—John C. Dell, Philadelphia, Pa.

I claim a graduated beam, B, connected to levers supporting a platform, L, in combination with a lever, F, which supports a "scoop," N, and which is connected to the beam, B, the whole being constructed and operating substantially as and for the purpose described.

71,589.—ROTATING-TOOTH CULTIVATOR.—Jay Densmore, Holley, N. Y., assignor to L. A. Densmore and Hiram Curtis.

I claim, 1st, A rotating cultivator tooth consisting of any number of teeth attached to a hub or common center around which they are free to revolve and set at an angle to the draft, substantially as described.

2d, The combination and arrangement with a rotating cultivator tooth of the standard, S, the pin, P, the bush, o, the washer, l, and the keys, l and n, substantially as set forth and described.

3d, The combination and arrangement with a rotating-tooth cultivator of the frame, B, the shaft, G, the cranks, F, the wheels, A A, the lever, L, the pin, 3, the cross bar, N, and the holes, 4 4 4 4 4 4, substantially as set forth and described.

4th, The combination and arrangement with a rotating-tooth cultivator of the pole, M, the guides, K and I, the pin, t, the holes, 2 2 2 2 2, the driver's seat, C, and the spring, E, substantially as set forth and described.

71,590.—CONDUCTOR'S TICKET BOOK.—Rudolph de Roode, Lexington, Ky.

I claim, 1st, A conductor's ticket book provided with two series of leaves and corresponding indexes for the places of departure and destination respectively, substantially as set forth.

2d, A passenger's ticket having a piece of money so secured within it as to be removable only by the destruction of the ticket, substantially as and for the purpose set forth.

71,591.—CAR BRAKE.—William H. Dunham and James Widney, Allegheny City, Pa.

We claim, 1st, The arrangement of the levers, C and C', pivoted to the hangers, h, and made operative theough the medium of the chains, 6, pulley, o, lever, x, and rods, 3 and 4, and made inoperative by means of the springs, 12, the whole constructed, arranged and operating in the manner herein described and for the purpose set forth.

2d, In combination with the above the rubber, B', and support, A', pivoted to the levers, C and C', the whole being constructed, arranged and operating in the manner herein described and for the purpose set forth.

71,592.—LOADING ORDNANCE.—James B. Eads, St. Louis, Mo.

I claim, 1st, The combination of a gun carriage, A C, with a shot lifter, composed of one or more steam cylinders, and a shot platform, E, the whole to be operated and employed in the manner shown and described.

2d, Also the shot platform when composed of a fixed bed piece, E, and a hinged or tipping piece, E1, for the purpose of disengaging the shot from the platform, in the manner shown and described.

71,593.—MELODEON.—Kaspar Ebermeyr, Ellwangen, Germany, assignor to Max Riederer, New York city.

I claim so combining the keys, the bellows, and reeds or pipes of a musical wind instrument that by the act of depressing the keys the appropriate bellows are put in operation and the required wind is created to produce the sound of the appropriate reeds or pipes, substantially as shown and described.

71,594.—MODE OF ATTACHING HANDLES TO CROSS-CUT SAWS.—J. E. Emerson, Trenton, N. J.

I claim the use of a wedge-shaped or wedging bolt for securing a removable and replaceable handle to a saw so that it will not only hold laterally but force the saw endwise against a bearing to give it an end support, substantially as described.

71,595.—DRAFTING INSTRUMENT.—Thomas Evans, Newark, N. J.

I claim, 1st, The combination of the scale rules, b and g with the square, a, made adjustable thereon, substantially as set forth.

2d, The arm, c, in combination with the slotted straight edge, b, each being provided with a point, d i, and made adjustable with relation to each other, substantially as and for the purpose set forth.

71,596.—CAR REPLACER.—B. W. Felton, Roxbury, Mass.

I claim my improvement or duplex car replacer, that is, as made with the two triangular projections, A B, and channels, a a, arranged on opposite sides of the plate and with respect to one another, substantially as set forth.

71,597.—ROOFING COMPOUND.—Samuel Fields, Bridgeport, Ohio.

I claim the roofing compound consisting of the above-named ingredients, substantially as described.

71,598.—RAILROAD JACK.—Alfred D. Fox, Oil City, Pa.

I claim the combination with the lifting screw carrying the swivelling hook which grasps the rail from beneath, of the nut or box mounted on the independent legs, when the several parts are constructed and arranged for joint operation as and for the purpose described.

71,599.—DEVICE FOR SMOOTHING CLOTH.—Christopher L. Frink (assignor to E. H. Robinson, E. L. Smith and Robert L. Frair), Rockville, Conn.

I claim the movable bearing bars, o, for the roller, p, applied substantially as specified, in combination with the main cylinder, b, and heated cylinder, c, as and for the purposes set forth.

71,600.—INSTRUMENT FOR CUTTING THE TIP FROM CIGARS PREPARATORY TO SMOKING.—Conrad Froehlich, Philadelphia, Pa.

I claim, 1st, The within described instrument, consisting of a frame constructed substantially as described, one or more conical openings, f and g, knife, B, and operating lever, D, all being arranged and operating substantially as set forth.

3d, The combination of the above with the receiver, h.

71,601.—RAILROAD TIME INDICATOR.—C. C. Gale, Cleveland, Ohio.

I claim, 1st, Indicating automatically the arrival and departure of railroad trains, steamships, stages, etc., over or along the line or direction of said carriers, mapped out, showing the position of stations on the route, for the purpose substantially as set forth.

2d, The indicators, K J, provided with curved arms, M, in combination with the endless cord, G, in the manner as and for the purpose specified.

3d, The application of the mechanical movements, when so arranged, in combination with the indicator, J', and operated by the same, as to signal by bells the arrival or departure of railroad trains, in the manner substantially as set forth.

71,602.—STOVEPIPE THIMBLE.—Jos. P. Gallagher, St. Louis, Mo.

I claim the thimble plate, B, provided with registers, b, in combination with the self-acting stopper plate, B' L, when the latter is arranged so as to be operated substantially in the manner as herein shown and described.

71,603.—SASH STOP.—Joel G. Garretson and Franklin D. Clark, Buffalo, N. Y.

We claim the eccentric segments, D E, geared together, and self-operating, by means of the weighted portion, e, and lever, F, arranged and operating substantially as and for the purpose set forth.

71,604.—FEED WATER HEATERS FOR LOCOMOTIVES.—Benj. Garvin and R. J. Pettibone, Oshkosh, Wis.

We claim the combination of the pipes, E D and F F F, etc., steam chambers, B C, arranged inside of a smoke stack and over the collar, H, substantially as and for the purpose herein specified.

71,605.—APPARATUS FOR FORMING THREADS ON SHEET METAL CAPS.—William T. Gillinder (assignor to himself and Edwin Bennett), Philadelphia, Pa.

I claim the apparatus herein described for swaging screw threads on sheet metal caps, substantially as set forth.

71,606.—GRINDING MILL.—Thomas Gray (assignor to himself and Henry Lapp), Clarence, N. Y.

I claim the corrugated plate, C, attached to the sliding journal bearings, c1, and adjusted by means of the set screws, d d' and F, for the purpose and substantially as herein described.

71,607.—RAILROAD SNOW PLOW.—Samuel G. Hadley, Cape Vincent, N. Y., assignor to himself, James C. Owen and A. D. Shaw.

I claim, 1st, A snow plow, having the two spirally inclined chutes, C, the spirally inclined division, E, and sides, D, when constructed and arranged for joint operation, as herein described.

2d, The construction and arrangement of the plow proper upon a secondary frame, in such a manner that the plow may be adjusted at varying inclinations, substantially as shown and described.

71,608.—GRUBBING MACHINE.—Daniel I. Hall, Dowagiac, Mich.

I claim the frame, A, the uprights, B B, the cross-piece, C, and the shaft, I, with its spool and lever handle, with the chains, F and G, arranged and used as and for the purpose set forth.

71,609.—MACHINE FOR DRESSING THE FRAMES OF SLATES.—Henry W. Harper, Berlinsville, Pa.

I claim the combination of the planing wheel, F, cutter wheel, G, fetching wheel, H, and guide plate, K, the whole being constructed and arranged for joint action on the slate frame, substantially as set forth.

71,610.—DEVICE FOR ARRANGING TYPE IN ROWS.—John M. Harper (assignor to himself and A. Corey), Philadelphia, Pa.

I claim the within described grooves for receiving the type, and the sliding blocks, y, in combination with the eccentric roller, D, and the spouts, E, or their equivalents, the whole being arranged and operating substantially as and for the purpose herein set forth.

71,611.—FOLDING STEPS.—Benj. J. Harrison and Jas. Condie, New York city.

We claim the folding steps constructed in the manner and for the purposes specified.

71,612.—MACHINE FOR MIXING AND FEEDING WHITE LEAD.—John Haslet, Jr., Alleghany City, Pa., assignor to himself, George W. Fahnestock and J. L. Schwartz.

I claim, 1st, The mixer, consisting of the tank, C, the water pipe, K, the discharge pipe, V, with its gaged cock, L; the revolving arms, G G, having the perpendicular blades, H H H H H H, etc., and the shaft, E, all constructed substantially as and for the purpose set forth.

2d, Combining with the mixer the feeder, having the revolving arms, P P P, and blades, R R R, shaft, S, the stationary blades, O O O O, and the gage-cock, L', constructed and operated substantially as and for the purpose set forth.

71,613.—ELASTIC CARRIAGE CURTAIN KNOB.—William H. Hawkins, Cleveland, O.

I claim the adjustable plates, A B, and rubber springs, C, or their equivalents, as arranged in combination with the curtain, G, for the purpose and in the manner set forth.

71,914.—HEAD BLOCKS FOR SAW MILLS.—Jonathan P. Haynes, Bedford, assignor to himself and Samuel C. Forsaith, Manchester, N. H.

I claim, 1st, The arrangement of the ratchet bar, P, and finger, k, in connection with and for operating the knee, D, all constructed and operating substantially as described and specified.

2d, The arrangement of the tape measure, m, index finger, o, and spring, n mounted on the shafts, O and N, for registering the set of the log, all constructed and operating substantially as described and specified.

3d, The arrangement of the eccentric handle, d, arm, b, shaft c, and the pawls, i and k, for disconnecting the traversing gear, so that the knees, D, are free to be moved in either direction, all constructed and operating substantially as described and specified.

71,615.—AUTOMATIC CLEATS FOR SAIL BOATS.—Lysander Hill, Alexandria, Va.

I claim the combination of the pendulum, P, sliding gage, R, chains, I I, or their equivalents, levers, L L, or their equivalents, spring stops, S S, and cleats, C C, substantially as and for the purposes set forth.

71,616.—DOOR SPRING.—Louis Hillebrand (assignor to himself, C. Liebrich and D. Wolf), Philadelphia, Pa.

I claim the wire spring, H, coiled round a rod secured to the frame of the door, and terminating in the arm, i, bearing against the door, when the center of the coil is in line with the hinges, all substantially as set forth.

71,617.—GAS AND OTHER RETORTS.—James John Holden and Sealy James Best, London, Eng.

We claim the employment of a chamber at the mouth of retorts, so disposed as to establish communication between two, three or more retorts, such chamber having a door, by opening which access is afforded to such two, three, or more retorts at the same time, substantially as described.

71,618.—STEAM SLIDE VALVE.—Brice W. Hudson, Allentown, Pa.

I claim, 1st, The valve, G, having the exhaust passages, K K', leading in reverse directions and on opposite sides of an oblique partition, I, and discharging through the projection, J, into the exhaust port, F, substantially as and for the purposes set forth.

2d, The construction of the ends, 6 and 7, of the valve, in relation to the side ports, E and E', to permit steam from the chest to flash around them and through the valve, substantially as and for the purposes set forth.

71,619.—MODE OF TREATING PETROLEUM TO REMOVE THE MORE VOLATILE PORTIONS.—Fleury Huot (assignor to himself and John Rogers), New York city.

I claim subjecting petroleum and other oils to the action of air, while such oil is in a finely comminuted or atomic condition, as and for the purposes set forth.

71,620.—MODE OF CONVERTING ARTICLES OF IRON INTO STEEL.—Richard A. Jackson, Lawrenceville, Pa.

I claim the use of the ingredients herein named, when compounded and used in the manner and in about the proportions herein described, and for the purpose set forth.

71,621.—CHALK HOLDERS FOR BILLIARD CUES.—James Jenkinson (ass'gnor to Daniel D. Winant), Brooklyn, N. Y.

I claim, 1st, A chalk holder formed substantially as set forth, for chalking billiard cues and similar articles, when pressed against the chalk in said holder, as specified.

2d, The rod, d, and spiral, in combination with the chalk holder, for the purposes set forth.

3d, Forming the chalk holder, b, with a screw ring, c, to secure the chalk and guide the cue, as set forth.

71,622.—FAUCET ATTACHMENT.—Geo. Johnson and Wm. H. Milliken, San Francisco, Cal.

We claim the faucet, A, in combination with the supplemental pipe, B, the plates, b b, and washer, D, all connected and arranged substantially as described and for the purpose set forth.

71,623.—CULTIVATOR.—J. P. Johnson, Macon, Ill.

I claim, 1st, The attachment of the forked plow beams, F F, to pendants, b b, by means of loose joints, c c, and the employment in combination therewith of the standards, G G, and diagonal braces, G' G', steps, g g, and driver's seat, D, arranged and operating substantially as described.

2d, In combination with plow beams, F, which are attached by loose connections at their forward ends, and sustained in position by diagonal braces, G' G', and standards, G G, the employment of suspending chains and stirrups for enabling the driver to raise and lowers the plows, substantially as described.

71,624.—ELECTRIC CLOCK.—Samuel A. Kennedy, Attleboro', and S. W. Holt and Joseph Gerlach, Philadelphia, Pa.

We claim, 1st, The combination and arrangement of two or more galvanometers, with two or more polarized steel bars, combined with the pendulum, and arranged either above or below the center of motion, substantially as described and for the purpose set forth.

2d, Producing a double automatic circuit, by means of the combination of the pendulum, H, with the sliding bar, L, arranged and operating in relation to the electric wires, p and p1, which project to the surface of the projections, o, and o1, of the bridge, K, substantially as described and for the purpose specified.

3d, The combination and arrangement of the electric wires with the batteries, the galvanometers, S and S1, the sliding bar or circuit changer, L, and the bridge, K, so as to produce a double-acting circuit by means of the motions of the pendulum, substantially as described.

4th, The combination of the ratchet wheel, E, with the pendulum, H, by means of the lever, F, forked bar, G, and pawl, I, arranged and operating in relation to each other, substantially as described, and for the purpose specified.

5th, The combination of the ratchet wheel shaft, c, with the shaft, s, by means of the wheels, C and D, and pinions, v and v1, substantially as represented.

6th, The combination of the set screw, j, with the forked bar, G, and paw l, substantially as and for the purpose set forth.

71,625.—SAW.—John L. Krauser, Tylersburg, Pa., assignor to J. E. Emerson, Trenton, N. J.

I claim, 1st, Making the tongued and grooved teeth thicker than the saw plate, as and for the purpose described.

2d, The devices, or their substantial equivalents, for holding the teeth against their inward thrust, constructed substantially as described.

3d, The tongues and grooves on and in the edges of the teeth and saw plate, when the grooves are made smaller than the tongues, by hammering, pressing, or otherwise, so that the sides of the grooves form a spring to clasp or gripe the tongue sufficiently tight to firmly hold the teeth in the saw when in motion, without the aid of any other fastening, substantially as described.

71,626.—GAME.—Geo. Krotzinger, New York city.

I claim the above described construction and arrangement of parts, constituting a new game for players, substantially as and for the purpose set forth.

71,627.—DOOR GONG.—Daniel Liebrich, Philadelphia, Pa.

I claim, 1st, The angular plate, C, hammer, D, trip lever, E, spiral spring F, and the stud, c, when combined and arranged as shown and described.

2d, The hammer, D, trip lever, E, and the pin, g, as shown and described.

3d, The hammer, D, trip lever, E, pin, g, and the spiral spring, F, as shown and described.

71,628.—DEVICE FOR HOISTING HOGS IN SLAUGHTER HOUSES.—James K. Martin, Chicago, Ill.

I claim the concave-shaped clutch, E, as described, suspended on chains or bars, as specified, in combination with bar, A, and its appendages (roller, handle and eyelet), the whole constructed and operating substantially as herein described and specified.

71,629.—BURNING FLUID.—Thomas Martin and J. G. Evans, Muscatine, Iowa.

We claim a burning fluid composed of the ingredients and combined in the proportions herein specified.

61,630.—VENTILATING COWL.—Benj F. Miller, New York city.

I claim, 1st, The curved air passage, c, extending from the trunk, b, to the mouth of the ventilator, as and for the purposes set forth.

2d, The inclined plate, f, and plate, g, in combination with the openings, 2 and 3, for receiving and discharging water that may enter the ventilator, as set forth.

3d, The opening, 4, at the lower end of the curved plate, e, for the purposes and as set forth.

4th, The flange plates, 5, upon the plates, d, extending from the plate, f, to direct moisture out through the opening, 4, as specified.

5th, The perforated doors, h h, in combination with ventilator, formed with the curved air passage, c, and flaring mouth, as and for the purposes set forth.

71,631.—CLOCK CASE.—Deitz Monnin, Paris, France.

I claim a cast metal clock case, having its front, sides, base, top and dial cast in one piece, as set forth.

71,632.—CONSTRUCTION OF CORRUGATED SHEET METAL BOILERS.—Geo. R. Moore, Lyons, Iowa.

I claim the longitudinal braces, B B B B, or their mechanical equivalent, in the form of longitudinal bolts or bars, substantially in the manner and for the purposes herein set forth.

71,633.—CARTRIDGE BOX.—Albert Newcomb and Benj. Lyon (assignors to themselves and Samuel W. Porter), Springfield, Mass.

We claim a cartridge box, having an elastic bed or support in the bottom of the chamber, b, upon which the cartridge may rest while in place, substantially as herein described and for the purposes specified.

71,634.—SPRING BED BOTTOM.—Bartolomeus J. Oleff, Milwaukee, Wis.

I claim a bed bottom made crowning, with slats, C and D, springs B, and hooks, E, in combination, substantially as and for the purpose described.

Also, hook, E, with its nut, G, in combination with the spring, B, and slat, C, connected thereto for the purpose of tightening the slat and spring, as described.

Also, the arrangement of the inside longitudinal slats, C, in pairs, connected to springs, B, with the two outside slats single, with their connections, as described.

71,635.—PAPER CLIP.—John H. Parsons, Quincy, Mich.

I claim, 1st, The plate, C, provided with the slots, d d, constructed as described, in combination with the clip, A, having the holes, h h, all arranged substantially as described, and for the purposes set forth.

2d, The combination of the clasps, T or H, plate, C, clip, A, and guides, y y, substantially as shown and described.

71,636.—FASTENING FOR GATES AND BARN DOORS.—Ezekiel Pea, Mechanicsburg, Ill.

I claim this combination of latch, B, spring, C, and lever, A, applied to gate and door fastenings, as described.

71,637.—BURGLAR ALARM AND LOCK APPARATUS.—Charles E. Pierce, New York city.

I claim, 1st, The combination of the bolts shown in figs. 5 and 6, with the parts 5a, 5b and 6a, operating to lock a window, in the manner shown.

2d, The parts represented on figs. 14, 14a, 14b and 14c, or their equivalent, operating as described and for the purposes set forth.

3d, In combination with the elements of the preceding claim, I claim the lever, O, operating as described.

4th, In combination with the alarm mechanism, I claim the levers for increasing the length of movement, and the rollers, all combined as and for the purposes set forth.

5th, The center wheel, M, on figs. 1 and 2, made up of parts, M1 and M2, for purposes set forth.

6th, The bolt on fig. 7, made up of parts, C', I, b', and K, for locking a door or gate, at the same time that it operates the alarm mechanism, as described and for purposes set forth.

7th, In combination with elements of the claim preceding, I claim the plates, J and H, as and for the purposes set forth

8th, In combination with the parts claimed in the second and third claims, I claim the dial plate with openings, as and for the purposes set forth.

71,638.—MECHANISM FOR FEEDING SCREW BLANKS.—Elijah S. Pierce, Hartford, Conn.

I claim, 1st, The combination of the cams, M and N, the levers, B C D and G, the rocking shafts, E and R, the connecting rod, F, the spindle, H, the conveying arm, J, the rod, P, the arm, Q, the rocking piece, L, the feeding trough, O, or their mechanical equivalents, the whole constituting a feeding and conveying mechanism, substantially as herein set forth.

2d, The combination of the conveying arm, J, the rod, P, the arm, Q, and the feeding trough, O, operating substantially as herein described and for the purpose specified.

3d, The conveying arm, J, the rod, P, and the arm, Q, constructed and operating substantially as described.

71,639.—ADJUSTABLE TUMBLERS FOR PERMUTATION LOCKS.—Oliver E. Pillard (assignor to Frederic H. North), New Britain, Conn.

I claim the friction strap, i, applied around the periphery of the stud disk, b, and within the notched tumbler, d, in combination with mechanism for tightening said strap, substantially as and for the purposes set forth.

71,640.—ADJUSTABLE TUMBLERS FOR PERMUTATION LOCKS.—James H. Porter, New York city, assignor to Frederic H. North, New Britain, Conn.

I claim the circular tumbler, d e, formed of two parts hinged together, in combination with the disk, b, and with mechanism substantially as specified, for drawing the parts of the tumbler together and clamping said disk, as set forth.

71,641.—BUTTON.—H. Prouhet, St. Louis, Mo.

I claim the disk, A', and the locking plate, a2, when combined and arranged substantially as described and set forth.

71,642.—SNOW PLOW.—Samuel Richards, Philadelphia, Pa.

I claim, 1st, Combining with an ordinary eight-wheel flat car or car bottom, the removable front plane, F, and the removable inclined top piece, F'.

2d, Combining with an ordinary eight-wheel flat car or car bottom, the removable front plane, F, the removable inclined top plane, F', and the upper wedge block, G, or their equivalents.

3d, The arrangement of an axle or windlass, I, endless cord, and shifting wedge piece, G, or their equivalents.

71,643.—SALT BOTTLE OR CASTER.—George B. Richardson, Boston, Mass., assignor to Thos. T. Sanborn and Wm. M. Cobb.

I claim the movable pulverizer, B, provided with points or projections, in combination with a receptacle, A, constructed and operating substantially in the manner and for the purpose set forth.

Also, in combination with the above, the piece, e, of cork, or its equivalent, placed at the bottom of the bottle, A, for the purpose described.

71,644.—JAWS FOR STEEL TRAP.—William Richter (assignor to S. D. Newbro), Lansing, Mich.

I claim the employment of the clutches, of the particular form and shape specified, constructed and attached to or near the external edges of the jaws of steel traps, substantially as above described and for the purpose set forth.

71,645.—CHURN.—F. W. Robbins, Salem, Ohio.

I claim a churn dasher when constructed with a spiral beater, p, continuous or in sections, in the manner substantially as set forth.

71,646.—LASTING SHOES.—Christopher Robinson and Wm. H. Lovejoy, Lynn, Mass.

We claim the improved mode of connecting the upper to the insole, viz., by the two ranges of sewing, one of which is carried through the other and the upper, and the other through the insole alone, as set forth.

71,647.—MACHINE FOR STRETCHING CLOTH.—Henry P. Roche, Utica, N. Y.

I claim, 1st, The combination of the roller, F4, with the supporting sockets, F5 and F3, and eccentric sleeve for disconnecting the socket from its driving mechanism, as and for the purposes described.

2d, In combination with the above, the spreading roller, H, constructed and operating as and for the purpose set forth.

3d, The combination of roller, F4, sockets, F3 and F5, and roller, H, constructed as described, with friction bars, B B, substantially as and for the purposes set forth.

4th, In combination with the above the bath, A, as and for the purposes set forth.

71,648.—SAFETY TRAP FOR BRIDLE.—Henry H. Rockwell (assignor to himself, Henry L. Bacon, and John H. Latham), New London, Conn.

I claim the arrangement and combination of the disks with the strap or straps and the rein rings thereof, the said disks being for the purpose and to operate as specified.

71,649.—HARVESTER RAKE.—John L. Rohrer, Upper Leacock Township, Pa.

I claim the combination and arrangement of the reel arms, J, with the spider, G G G, and pinion, F, in combination with the pinion, E, operating obliquely, both on the same shaft, and operated with the raking attachment, in the manner and for the purpose specified.

Also the arrangement of the clutch, B, in its flange, pivot, b, on the cap, A, operated by a spring rod, N, to connect and disconnect the cap with the driving wheel, O, which actuate the rake and reel, in the manner and for the purpose set forth.

Also the bent or shouldered plates, Q, provided with a straight and a curved slot, when employed for connecting and adjusting the rake arm, I, or reel arms, J, with the arms, G and H, in the manner and for the purpose specified.

71,650.—WASHING MACHINE.—W. C. T. Runnells, Searsport, Me.

I claim the combination of the corrugated and hinged bottom, g, with the rollers, j, table, e, weight boxes, f, shaft, d, crank, b, cord, k, and tub, a, substantially as and for the purpose specified.

71,651.—LAMP CHIMNEY.—E. O. Schartau, Philadelphia, Pa.

I claim the glass chimney with the flared top, whether scalloped or plain on the edge, as herein described.

Also the glass chimney having a shoulder formed at the top, for the purpose of permanently attaching a glass or metallic toy, as herein described and for the purposes set forth.

71,652.—CHURN.—Arba M. Seymour, Jr., Madison Wis.

I claim the construction, arrangement, and operation of the dashers, as and for the purpose specified.

71,653.—HARNESS PAD BLOCK.—Palmer Shaw, Syracuse, N. Y.

I claim, 1st, A harness pad block when so constructed that the portion in which the nails are driven is made separate and detachable from the main portion of the block, substantially as and for the purpose set forth.

2d, The hollow iron block, A, filling, B, and set screws, c c, constructed and combined substantially as herein shown and for the purpose described.

71,654.—BED BOTTOM.—Charles E. Simmons and Homer Cook, Waukegan, Ill.

We claim the combination of braces, D D D' D' and F F, hinged to the upper frame, B, and to the plates, f f, with the pivoting plates, C C, arranged and operating as described.

71,655.—TWINE HOLDER.—R. L. Smith, Wolcottville, Conn.

I claim the loop or ring with the upper part of the twine holder, for the purposes and as specified.

71,656.—WASHING MACHINE.—Thomas Smith, N. Y. city.

I claim the circular flexible and spinning washboard, in combination with a series of rotating or vibrating extensible arms and clamps, or their equivalents, carrying the fabrics to be washed, all operating substantially in the manner and to the effects described.

71,657.—APPARATUS FOR GENERATING OXYGEN GAS.—Benj. R. Smithson, New York city, assignor to himself and Samuel West, Boston, Mass.

I claim the within described apparatus for generating oxygen gas, constructed and operating substantially as set forth.

71,658.—SHOEMAKER'S LAMP.—John M. Sporer, Philadelphia, Pa.

I claim the combination and arrangement of the cylinder, B, trough, D, curved arms, E E', and the steady rests, b b', as shown and described.

71,659.—GRATE FOR STOVES AND OTHER HEATERS.—Samuel B. Stewart, Brush Valley, Pa.

I claim, 1st, A gate swinging horizontally and communicating successively with two or more separate flues, substantially in the manner described, for the purpose of warming different rooms in succession by a single fire.

2d, A revolving grate divided into compartments, each communicating with an independent flue, substantially in the manner described.

3d, The combination, substantially in the manner described, of a revolving grate, divided into compartments by vertical radial partitions, and revolving on a vertical axis, with a flue having corresponding partitions, for the purposes set forth.

4th, The combination, substantially in the manner described, of a revolving grate, with a heating or cooking stove, and one or more open grates, for the purpose of applying the heat successively to each, or simultaneously to all, as set forth.

5th, the combination, substantially in the manner described, with a revolving grate having radial partitions or wings attached to and revolving with it, in the ash pit of a discharge spout, for carrying off the ashes swept into it by the wings in their revolution.

71,660.—GRAIN BINDER.—Ole O, Storle, Norway, Wis., assignor to himself and Isaac N. Mason, Milwaukee, Wis.

I claim, 1st, Rake, B, endless chain, C, spur wheels, D and D', connecting rod, E, loose wheel, F, socket, G, and sliding way, H, in combination substantially as described.

2d, Compresser, c, binding cord, l, crank, d, and wheel, S, in combination, when operated substantially as and for the purpose described.

3d, Wabbling wheel, U, pulleys, V, and nippers, X, in combination, operating substantially as and for the purpose described.

4th, Clutch, M, spring, P, lever, Q, and wheel, S, in combination substantially as described.

5th, Clutch, M, pinion, R, wheel, S, wheel, T, and cylinder, W, operating in combination, substantially as described.

6th, Slotted wheel, Y, in combination with compresser, c, and nippers, X, substantially as and for the purpose described.

7th, Slotted wheel, Y, knife, Z, and spring, a, in combination substantially as described.

71,661.—HORSE HAY FORK.—H. C. Stouffer, John Heaton and Alpheus A. Bushing, Columbiana, Ohio.

We claim the curved lever, E, check rod, F, and spring, H, as arranged, in combination with the link, D, and feet, C, in the manner as and for the purpose described.

71,662.—HAT IRONING MACHINE.—George W. Stout and John C. Richardson, Newark, N. J., assignors to themselves, James Davis, Jr., and Samuel R. Hawley.

We claim, 1st, A pair of irons operating in conjunction to iron simultaneously both sides of the brim, substantially as described.

3d, The combination in the same machine of revolving irons for finishing the brim, and also the top and sides of the crown.

3d, Finishing irons operating simultaneously upon the top of the crown, both sides of the brim, and also upon the sides of the crown.

4th, So combining the irons which operate upon the brim only, that they may be readily separated from each other at will, as and for the purposes described.

5th, The combination of the brim irons with their connecting spring, rod, and crank, substantially as and for the purpose set forth.

6th, The combination of the brim irons with their driving mechanism, so as to admit of the shifting of the positions of the irons without arresting the motions derived from the driving mechanism, substantially as set forth.

7th, The combination of the brim irons and the top iron with their driving mechanism, so that the relative positions of the irons may be changed, for the purpose set forth.

8th The combination of a revolving hat block with revolving irons.

9th, The combination of a swinging arm which carries the side irons, with a pivoted head stock, as and for the purpose described.

10th, The combination of a swinging arm, which carries the hat block, with a swinging arm which carries a finishing iron.

71,663.—SIZING FOR BANK NOTE PAPER.—John M. Sturgeon, New York city.

I claim a sizing made from the within formula, substantially as described, and combined for the purposes set forth.

71,664.—STUFFING BOX PACKING.—Charles M. Templeton, Concord, N. H.

I claim the packing ring consisting of the outer parts, R R R, and the inner parts, r r r, the same being arranged to break joints with each other, in common with the follower, F, all operating as and for the purpose described.

71,665.—CARBURETING APPARATUS.—Wm. Thompson and J. E. Hall, Cleveland, Ohio.

We claim, 1st, The agitator, J, constructed with an annular chamber, L, wings, M and N, and tubular arms, O, in the manner and for the purpose substantially as set forth.

2d, Perforated lining, B, top, Q, spouts or sleeves, C, and cotton, D, or its equivalent, as arranged in combination with the float, E, and agitator, J, in the manner and for the purpose substantially as described.

3d, The float, E, agitator, J, constructed as described, in combination with a carbureter, in the manner and for the purpose substantially as described.

4th, The herein described apparatus provided with a float and a revolving agitator, constructed as described, whereby the carbureting fluid is agitated for the purpose of largely increasing its evaporation or elimination, substantially as and for the purpose set forth.

71,666.—REGULATING WATCHES.—Hiram Todd, Columbus, O.

I claim, 1st, The combination of the screw, E, sliding nut, B, link, C, and the regulator bar, H, as shown and described for the purpose specified.

2d, The employment of the expansion and contraction of the link, C, in combination with nut, B, and regulator bar, H, constructed to act upon the hair spring of the watch and more perfectly regulate the same, as set forth.

71,667.—COMPOSITION FOR ROOFING.—Reuben Tyler and Peter Campbell, Jr., Diana N. Y.

We claim the composition of coal or gas tar with marl and a small quantity of pulverized marble, which will harden and make a good water-proof or fire-proof roof for building purposes.

71,668.—MACHINE FOR CUTTING AND MITERING PRINTERS' RULES.—Richard Walker (assignor to himself and Joseph B. Bancroft), Milford, Mass.

I claim, 1st, The cutter, n, attached to the adjustable head, m, in combination with the cutter, d, as described.

2d, The combination of the segmental platform, l, with the cutter, n, cam lever, o, and head, m, as set forth.

3d, The combination of the cutter-holding arm, b, the connecting bar, e, the cam, h, and the spring rod, k k', substantially as and for the purpose described.

4th, The graduated bar, r, and gage, s, in combination with the platform, l, as and for the purpose described.

71,669.—SAWING MACHINE.—Peleg Werni and Reuben B. De Bare (assignors to Reuben B. De Bare), Chicago, Ill.

We claim suspending the saw upon the rod, R, passing through a slid, T, which has a vertical movement upon rods, a a, attached to the vertical frame, said slide being provided with a cord, b, passing over a pulley, c, all constructed and operating in the manner as and for the purposes specified.

71,670.—CUTTER HEAD FOR MOLDINGS.—John Whitworth (assignor to himself and W. H. Hawkins), Cleveland, Ohio.

I claim the herein described chilled cast iron cutter, made in the manner as and for the purpose substantially set forth, as a new article of manufacture.

71,671.—PORTABLE HOSE BRIDGE.—Algernon L. Wilkinson, Huntsville, Ala., and Elias Y. Beggs, Nashville, Tenn., assignors to Algernon L. Wilkinson.

I claim the arches, B B, when constructed of single pieces of angle or channel iron, and provided with lugs, c c, to hold them to a railroad track, in combination with the cross bars, o o, constructed with a swivel link, Y, and a goose neck, n, substantially as and for the purpose indicated.

71,672.—SCROLL SAW MILL.—Benj. F. Williamson, Franklin County, Ohio.

I claim the inclined and adjustable revolving platform or table, D, constructed to operate substantially as described and for the purpose set forth.

Also, in combination with the post, A, the plate or heading, I, constructed to operate substantially as and for the purpose set forth.

71,673.—CAR COUPLING.—M. K. Adams, Mountain Eagle, Pa.

I claim a car coupling consisting of the double-headed bolt, E, in combination with the draw head, A, provided with the recess, I, and hinged lid, B, having the loop, c, attached, when the whole is arranged to operate substantially as described.

71,674.—HOISTING DEVICE FOR TRUCKS.—Nathan Albertson, Plainfield, Ind.

I claim the vertical rack, E, operated by the lever, F, in combination with the spring dog, b, when attached to a truck constructed, arranged, and operating as and for the purpose described.

71,675.—GATE.—Wm. J. Alexander, Rolling Prairie, Ind.

I claim the gate, A, the braces, C and E, the chain, F, with the weight, G, and pin, I, as substantially arranged and set forth in the foregoing.

71,676.—WHEEL.—Julius M. Bailey, Indianapolis, Ind.

I claim, 1st, The socket, b, when provided with grooves upon one side, in which the tenons of the felleys fit, and with grooves upon their inner sides to receive the tenons formed upon the wedge, C, said wedge adjusted by means of the bolt, d, whose head is countersunk in the tire, A, and the nut, D, all constructed as described for the purpose specified.

2d, Having the spoke, E, stepped into the slotted bed or socket, F, in combination with the wedge, G, all substantially as set forth and described.

71,677.—EXHAUST FOR MILLSTONES.—David Baird, Bloody Run, Pa.

I claim the combination and arrangement of the box, B, having the discharge port, D, and inclosing the millstones, with the exhaust pipe, E, chamber, C, having two outlets, c c, and the fan, F, the latter arranged between the two exhaust pipes, e e, and drawing the air through each of them, substantially in the manner and for the purposes indicated.

71,678.—HEAD BLOCK FOR SAW MILLS.—Thomas C. Ball (assignor to himself, Abijah S. Clark, and Sumner Chapman), Bellows Falls, Vt.

I claim, 1st, The combination of the knees, C C, tables, T, and rod, R, substantially as and for the purpose described.

2d, The combination of reversing lever, L, having the pin, l, arm, s', and weighted lever, M, with the grooved wheel, S', attached to the shaft, S, all being constructed and arranged substantially as and for the purpose specified.

71,679.—CURTAIN FIXTURES.—Ashbel P. Barlow, Claremont, N. H.

I claim, in combination with a central supporter, b, the cords, d d and a a, with their supporting eyes, for lowering the upper and raising the lower part of the curtain without rolling it, all as set forth and specified.

71,680.—MACHINE FOR MAKING TIN CANS.—Christian Barry, Philadelphia, Pa.

I claim, 1st, The mode of manufacturing cans, substantially as herein described.

2d, The roll, C, with bevelled edge, f, and roll, B, with flange edge, g, operating together, substantially as described for the purpose specified.

3d, The swage or die, J, having bevel periphery, q, and swage or die, K, with its periphery, r s, bevelled and shouldered, operating together substantially as described for the purpose specified.

71,681.—MACHINE FOR STAINING PAPER.—Chas. Bartholomew, New York city.

I claim, 1st, In machines for staining or coloring wall or other paper, the application and use of the supplementary table, J, or equivalent device, between the paper and travelling apron, at the point or points where the coloring matters are applied, substantially as and for the purpose described.

2d, The division of the color box into front and rear compartments by a partition, F, so that one set or series of colors shall be discharged in advance of another set or series, substantially as described.

3d, The arrangement of the several discharge openings of the color box in such a manner that those of the front compartments shall be opposite the solid interspaces of the rear compartments, substantially as described.

4th, Two or more openings in the same straight line in the bottom of a color box, or the bottom of a compartment of a color box, in combination with solid interspaces between such openings, for the purpose of producing stripes of color from the same compartment or receptacle, substantially as shown.

5th, The combination with a cistern, L, for the supply of color, of a strainer, M, constructed and arranged substantially as described.

6th, The arrangement, in the supply cistern, of a settling well, N, substantially as set forth and described.

71,682.—CRANE.—A. S. Batten, Topsham, Vt.

I claim, 1st, The crane, consisting of the arm, B, pivoted as described, to the double or slotted cross piece, C, and working therein and in the double or slotted brace, F, substantially as above set forth and described.

2d, The said crane, in combination with the windlass and rope or cable, substantially as described.

3d, The sleeve, N, carrying the hooks, M, in combination with arm, B, substantially as above set forth and described.

71,683.—MACHINE FOR BORING BOBBINS.—Vertot D. Beach, Battle Creek, Mich.

I claim, 1st, The use of the oil cup, C, with the brush, as described, for the purpose of oiling the reciprocating boring bits.

2d, The revolving bit holder, D, constructed and arranged to operate substantially as and for the purpose specified.

3d, The arrangement of the dog, H, the semi-elliptic springs, L L, the levers, R R, the rods, M N, the hooks, w and 6, the leaf-springs, 7, the bar, v, and the stop, s, the links, I I, the nuts, 9, and the spiral spring, P, arranged and operating substantially as and for the purposes specified.

71,684.—MODE OF PACKING SMOKING TOBACCO.—F. W. Beck and E. W. Siebert, Baltimore, Md.

We claim, as a new article of manufacture, a package of cut smoking tobacco, the envelope of which is a cloth bag, constructed, as described, so that it can be opened and closed at pleasure, in the manner and for the purpose specified.

71,685.—TRUCK.—Wm. P. F. Beggs, Philadelphia, Pa.

I claim, 1st, Connecting the front end of a truck platform, A, with the platform, H, of the front running gear, by means of two or more crane-neck bars, I I, substantially as herein shown and described.

2d, The front axle, D, fifth-wheel, F, kingbolt, G, and front platform, H, in combination with the crane-neck bars, I, main truck-platform, A, and rear axle, B, all made and operating substantially as herein shown and described.

3d, The crane-neck bars, I, when arranged as described, to connect the main truck platform, A, with the platform, H, of the front running gear, and when provided with flanges a and b, by means of which it can be firmly secured to the respective platforms, as set forth.

71,686.—INK WELL.—Thomas Bell, New York city.

I claim the arrangement of a projection or ridge either on the under surface of a sliding ink well cover or on that part of the ink well table or desk over which the cover passes when being opened, substantially as and for the purpose described.

71,687.—CASTING METAL PIPE.—Benjamin S. Benson, Baltimore, Md.

I claim the anchor or stay, above described, consisting of the wire hoop, a, the doubled plates, e e, and the bolts, l l, when the parts are constructed and arranged substantially in the manner shown, and for the purposes specified.

71,688.—INSULATING COVERING FOR TELEGRAPH AND CIRCUIT WIRES.—Samuel C. Bishop (assignor to Bishop Gutta-Perch Co.), New York city.

I claim insulating telegraph and electric wires or conductors by means of valata or balata, substantially as specified.

71,689.—FERTILIZER.—Joseph W. Bitner, Downsville, Md.

I claim, 1st, The above described process of damp-rotting manure, and then pulverizing the same, substantially in the manner and for the purposes set forth.

2d, Also, the new fertilizer, prepared by rotting, drying, and then pulverizing manure, substantially as described.

71,690.—MODE OF PREVENTING HEATING MILL BURRS.—Mentor Bradley, Peru, Ind.

I claim the narrow hoop, A A, and canvas or other similar light material, adjustable to any desired hight around the burrs.

71,691.—SCREEN-GUARD ATTACHMENT.—G. Brain, Springfield, Ohio.

I claim the screen, A, in combination with the adjustable hinged plate, B, applied to a cultivator plow, to operate in the manner substantially as and for the purpose set forth.

71,692.—PESSARY.—Emeline T. Brigham, of Philadelphia, Pa.

I claim the pessary, A, conical spiral spring, B, with wire, C, having ring, D, constructed and arranged to operate as and for the purpose specified.

71,693.—ANIMAL TRAP.—Geo. W. Brown, Sacramento, Cal.

I claim the arrangement of the tipping plates, as described, and for the purpose set forth.

71,694.—GATE FASTENING.—Jas. Bull, Galesburg, Ill.

I claim, 1st, The catch, D, constructed in the manner herein represented, being bevelled off to an edge at each end, provided with a dovetailed groove at the center of its upper side, and balanced so as to vibrate upon its pivot, a substantially as and for the purpose specified.

2d, The stop or latch, S, so formed as to act in connection with the catch, D when constructed in the manner and for the purpose specified.

71,695.—DEVICE FOR OPERATING PUMP ON RAILROAD STATIONS.—Hiram H. Call, Roberstown, Pa.

I claim the rockers, R, combined by a horizontal shaft, H S, actuating a vertical rocking shaft, S, arranged and operated substantially in the manner and for the purpose specified.

In combination with the rocker, R S, I also claim the two pawls, W, for clutching alternately the two twin spur wheels, A A, arranged substantially in the manner for operating pumps at railroad stations, as described.

71,696.—EGG BEATER.—Geo. G. Carver, Roxbury, Mass.

I claim the combination of the two handles with the glass tube and the head of stoppers and the stirrers, arranged within such tube, substantially as herein before specified.

Also, The combination of each stirrer as composed of the annulus, the series of parallel cross bars, and the rod extended therefrom, with the movable head or stopper to fit into the glass tube, as specified.

71,697.—PORTABLE FENCE.—Ziba Castaline, Baconsburg, O.

I claim the herein described fence, when constructed and arranged in the manner substantially as set forth.

71,698.—FIREPLACE.—A. E. Chamberlain and J. B. Crowley (assignors to Chamberlain & Co.), Cincinnati, Ohio.

I claim, 1st, An open-front stove or fireplace, arranged substantially as herein described, to take the air to support combustion from above and downward through the fuel.

2d, In an open stove or fireplace, constructed as above specified, we further claim the extended grate, J, substantially as and for the purposes set forth.

3d, In an open stove or fireplace, constituted as above specified in the first clause, we claim the interior plates, C C', for the purpose of forming the descending flues, F F', substantially as herein explained.

4th, In combination with the elements of the first clause, we further claim the flue strips, K k k', as and for the object stated.

71,699.—HITCHING STRAP.—Thomas P. Chambers, Newtown, Pa.

I claim a self checking hitching device, consisting of the chain or strap, D, fastened by means of snap hooks or otherwise to the ends of the bridle bit and combined with the hitching strap, substantially in the manner and for the purpose herein shown and described.

71,700.—BED BOTTOM.—D. G. Chapin, Galena, Ill.

I claim fastening the coiled springs of beds to the slats by means of a broad-headed nail passed through the apex of said spring, as herein shown and described.

71,701.—ELECTRO AUTOMATIC SIGNAL BOXES.—C. T. Chester, New York city.

I claim, 1st, The combination of a train of wheels controlled by escapement and driving an electric circuit wheel, with a sliding actuator, which is engaged with the winding lever of the train, or is disengaged from it at pleasure, substantially as described.

2d, The combination of this sliding actuator with the box cover, so that dust and other matters are excluded from the interior, substantially as described.

3d, The combination of a train of wheels, controlled by escapement and driving an electric circuit wheel, with a stopping lever which is moved by the actuator, and which engages with the stopping pin of the circuit wheel, substantially as described.

71,702.—LINE HOLDER.—S. J. Clark, Detroit, Mich.

I claim the eccentric wheel, A, stop, B, plate, D, and the cap, C, or substantially the same, for the purpose designed.

71,703.—TEMPORARY BINDERS FOR MUSIC, ETC.—John C. Clarke, Jersey City, N. J.

I claim, 1st, The combination of the rigid metallic back, C, having cross

lots, c', formed in it, and the hinged side plates, D, with each other, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cord or cords, E, with the slotted back plate, C, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the slotted back plate, C, and hinged side plates, D, with the side bearers, A, and back, B, of the cover, substantially as herein and described and for the purpose set forth.

71,704.—TRACK CLEARER.—M. E. Cogan and M. R. Russell, Mobile, Ala.

We claim, 1st, The scrapers, G G', having the gain, e, and the transverse slots, l l, substantially as and for the purpose desired.

2d, The combination of the scrapers, G G', with the standards, C C, handles or levers, D D, and springs, F H H', when constructed and operating substantially in the manner and for the purpose specified.

71,705.—THILL COUPLING.—James P. Collins, Troy, N. Y.

I claim, 1st, The connecting of the thills of a vehicle to the axle thereof by means of any suitable flexible material, substantially as and for the purpose specified.

2d, The socket, A, provided with the two internal parts or compartments, a b, in connection with the key or wedge, F, and the looped end of the flexible material, Cx, provided with the metal plate, E, and secured to the under side of the thill, C, all arranged substantially as and for the purpose set forth.

71,706.—SAFETY POCKET.—Joseph Colton, New Orleans, La.

I claim the combination of the jaws, A B, piece, C, slides, a, spring sides, b d, springs, e f g, pin, h, and the pocket, as herein described, for the purpose specified.

71,707.—DENTAL SUBSTITUTE.—George W. Cool, Portland, Oregon.

I claim the mode of fastening the thin plate or lining to the vulcanite or other dental plate heretofore in use, in the manner above described.

71,708.—FIRE FRAME FOR CHIMNEYS.—John Correja, Brooklyn, N. Y.

I claim the metallic jambs for kitchen chimneys, formed in the manner and for the purposes set forth; and in combination therewith the metallic lintel, throat piece, and back plate, as and for the purposes set forth.

71,709.—FLOUR BOLT.—Martin Cosgro (assignor to himself and Geo. H. Reynolds), Peoria, Ill.

I claim a bolt, B, provided with broad arms, or wings, C, constructed and arranged substantially as described, for promoting and equalizing the currents of air, which are made to pass through the bolt by means of the exhaust fan, K.

71,710.—MANUFACTURE OF HORSESHOE NAILS.—Harley D. Cowles, Bridgeport, Conn., assignor to the Bridgeport Horseshoe Nail Company.

I claim, 1st, The compound cutting aparatus, consisting of the series of dies and the series of cutters, substantially as herein described,

2d, The The method, herein set forth, of making nails for horseshoes, namely, by first rolling the plate to the form described and represented by figs. 1 and 2, and then cutting the nails therefrom by means of the series of dies and series of cutters, secured or formed in sectional holders, all as herein described.

71,711.—DRAUGHT AND VENTILATING DEVICE FOR OPEN GRATES, ETC.—Jas. M. Crockett, Newbern, Va.

I claim the arrangement and construction of the box, A, damper, C, lid, E, and pipe, D, when combined as herein described and for the purposes set forth.

71,712.—MEDICAL COMPOUND.—William Davidson (assignor to himself and William J. Rannie), Binghamton, N. Y.

I claim the composition herein described for the purposes set forth.

71,713.—BELT-LACING DEVICE.—David P. Davis, New York city.

I claim the two-part lacing, A, for belts, etc., each similarly constructed, substantially as described.

71,714.—SHINGLE MACHINE.—Benj. Day, Bangor, assignor to himself and A. L. Smith, Orrington, Me.

I claim, 1st, The sliding frame, B, adjustable forming board, H, knife, K, and self-adjusting roller, I, all constructed and arranged to operate in the manner and for the purpose substantially as described and shown.

2d The auxiliary bearing, o, constructed and arranged to move with the forming board a part of its descent, and to resume its position and office upon the ascent of the forming board, substantially in manner as and for the purposes specified.

3d, In combination with knife, K, and roller, I, the hinged shield, L, substantially as described and shown.

71,715.—PLOW.—Samuel T. Denise, Red Bank, N. J.

I claim the combination, in a plow, of the vertical roller, E, with the horizontal roller, I, the latter rotating the former, substantially in the manner and for the purpose specified.

71,716.—WASHING MACHINE.—George M. Denison, New London, Conn.

I claim, 1st, The rubbing surface composed of bristles arranged in rows, alternating with elastic ribs or ridges, substantially as and for the purpose specified.

2d, The roller, C, arranged in relation with the rows of bristles, and the elastic ribs or ridges, substantially as and for the purpose specified.

3d, The rubber, constructed in the manner specified, in combination with the guides, a, in the side pieces of the corrugated board, substantially as and for the purpose herein set forth.

71,717.—CAR COUPLING.—M. Disney, San Francisco, Cal.

I claim, 1st, A car coupling, having a movable retaining lip, C, clutch, b, and the detaching lever, E, the whole constructed and operating substantially as and for the purpose herein described.

2d, The automatic catch, d, constructed and operating substantially as and for the purpose described.

71,718.—HARVESTER RAKE.—J. A. Dodge and Geo. Perry, Auburn, N. Y., assignors to John A. Dodge.

We claim, 1st, The switch, S, constructed, arranged, and operating as described.

2d, The combination, with a continuously rotating rake, of a vertically moving latch, T, constructed, arranged, and operating as described.

3d, The combination, as described, of the vertically moving switch, S, with the stop, s1, for the purpose set forth.

4th, The combination, substantially as described, with the continuous cam guide of the switch arranged to play vertically to change the path of the rakes.

5th, The combination, with a continuous cam guide, K, of an outside track, k, a switch, S, and a latch, T, when both the latter are arranged to play vertically, for the purposes set forth.

6th, The combination of the switch, S, the crank arm, s2, the cord, s3, the spring, s4, all constructed and arranged as described, for joint operation.

7th, The comb nation of the independently hinged rising and falling rake arms, continuously rotating round a common center, with the continuous cam guide, the vertically moving switch, and the latch, whereby either one of the arms can be used as a reel or as a rake, at the pleasure of the operator.

8th, The rake arms, having curved depending arms carrying friction rollers, and operating as described.

9th, The arrangement of the friction rollers on the bent arms, n, so that they always travel outside of the continuous cam guide, K.

10th, The combination of the continuous cam and fixed cam plate, with the independently hinged, continuously rotating, rising and falling arms, carrying friction rollers, running outside of the cam guide, and controlled by the switch, whereby the beaters are made to act as either a rake or a reel, as required.

11th, The combination, substantially as described, with a continuous guide, a cam plate, a cam plate, a switch, and a latch, of independent continuously revolving rising and falling arms, a crown wheel carrying the arms, and a bevel wheel to rotate them.

12th, The combination and arrangement, substantially as described, of the drag bar, the adjustable shoe, and the finger beam, with the raking mechanism, whereby the rake can be mounted directly over the shoe, without interfering with the adjustability of the shoe.

13th, Mounting the rake on the adjustable bar, b, as and for the purpose described.

14th, The combination of a platform and hinged drag bar, having a standard mounted on each, with raking mechanism mounted in a frame adjustable backward and forward on the standards, substantially in the manner and for the purpose described.

71,719.—YARD MEASURE.—Joseph Douglass, McConnellstown, Pa.

I claim the yard stick, with handle, B, and measuring flanges, C C', substantially as described.

71,720.—CAR BRAKE.—Eugene Hippolyte Duru, Paris, France.

The adjusting gear, B F N, in combination with the pincers, C, and with a railroad car, substantially as and for the purpose set forth.

71,721.—LOCKING KNOB LATCH.—Carl Herrman Eiffler, New York city.

I claim, 1st, The arrangement of an adjusting screw, a, provided with a transverse hole to receive the set screw, b, in combination with the spindle, C, and knobs, D E, constructed and operating substantially as and for the purpose set forth.

2d, Inclosing in the knob, E, the mechanism which serves to throw said knob in and out of gear with the latch, substantially as and for the purpose set forth.

3d, The nut, c, on the spindle, C, in combination with the movable stump, d, tumblers, g, knob, E, and latch, B, constructed and operating substantially and for the purpose set forth.

4th, The safety stop, o, in combination with the knob, E, washer, F, and latch, B, constructed and operating substantially as and for the purpose described.

5th, The disk, f, provided with cam slots, e e, in combination with the movable stump, d, safety stop, o, and tumblers, g, constructed and operating substantially as and for the purpose set forth.

6th, The aoutment, a, in combination with the keyhole and with the safety stop, o, constructed and operating substantially as and for the purpose described.

71,722.—NUT LOCK AND WASHER.—Edward A. Ellsworth, Washington, D. C.

I claim, 1st, The spring nut lock, K, and washer, A, constructed in one piece, substantially as described, for the purpose specified.

2d, One or more points or downward projections or flanges, a, in combination with the spring nut lock and washer, substantially as described, for the purpose specified.

71,723.—DOUGH-KNEADING MACHINE.—Samuel Emmore (assignor to himself and A. Burkholder), Stouchburg, Pa.

I claim, 1st, The shaft, C, when provided with a screw thread, so as to impart a combined intermittent rotary and reciprocating motion for the stirrers of a dough kneading machine, substantially as and for the purpose herein shown and described.

2d, The tub, A, when consisting of two parts hinged together, in combination with the sliding cover, D, all made and operating substantially as herein shown and described.

71,724.—FERTILIZING COMPOUND.—Levi S. Fales, Tarrytown, N. Y.

I claim the fertilizer, composed of sea sand, sulphate of ammonia, charcoal, bones, and dried blood, substantially as herein set forth.

71,725.—FERTILIZER.—Levi S. Fales, Tarrytown, N. Y.

I claim the fertilizer, formed by the combination of the several specified materials, substantially as herein set forth.

71,726.—SADDLERS' AND SHOEMAKES' TOOLS.—George V. Farr and Ephraim Hall, Brandon, Vt.

We claim, 1st, The channelling tool above described, composed of the adjustable knife, B, the stock, A, and the spring cap, C, the lip or bottom of the cap, and the shoulder, O, of the stock, forming a gage to bring the knife at the edge of the sole to be channelled, substantially as set forth.

2d, The rounded or curved forms of the cap, C, and shoulder, O, in the direction of their length, substantially as and for the purpose described.

71,727.—BIT BRACE.—Samuel F. Fenn (assignor to himself and F. B. Clark), Middletown, Conn.

I claim the spring stirrup, a, attached by the pivot, b, to the spindle, A, of a brace, constructed and operating substantially as and for the purpose described.

71,728.—DEVICE FOR FILLING AND PACKING ROTARY PAPER PULP BOILERS.—Albert Fickett, Rochester, N. Y.

I claim, 1st, The use of a screw shaft and a movable head working upon and operated by the screw shaft, substantially as above described.

2d, The said screw shaft and movable head, in combination with the use of the tight pulley, A, operated by two bolts, one open, the other crossed, in conjunction with the lever, H, and the belt tighteners, b b, substantially and for the use above described.

3d, The use of two or more guide pieces fastened to the interior surface of the rotary or cylinder in a longitudinal direction, which perform the double function of preventing the movable head from turning when the screw shaft is put in motion, and of agitating the contents of the rotary.

4th, The use of a hollow and perforated screw shaft, substantially and for the use above described.

5th, The use of a perforated piston head to allow free circulation of the liquor and steam, substantially as above described.

71,729.—LOW WATER INDICATOR.—R. A. Filkins, North Adams, Mass., assignor to himself and W. B. Werden, Waukegan, Ill.

I claim, 1st, The tube, E, in combination with the tube, B, whereby the cold air is prevented from striking the tube, B, while hot water is in the latter, substantially as described, for the purpose specified.

2d, The lever, F, pivoted to the arm, h, of the globe, C, sliding rod, l, to which the float, G, is secured by the chain, n, packing tube, m, and spring, o, all arranged and operating as herein set forth, for the purpose specified.

71,730.—ROTARY STEAM VALVE.—R. A. Filkins, North Adams, Mass., assignor to himself and W. B. Werden, Waukegan Ill.

I claim the construction of the hollow conical valve, C, and its arrangement with the shell, E, nut, F, flange, c' partition, j, ring, f, shoulder, m, and pipe, A, all made and operating substantially as and for the purpose herein shown and described.

71,731.—ROOFING CEMENT.—R. H. Fitts, Lawrence, Kansas.

I claim the composition, substantially as described, and for the purposes set forth.

71,732.—TOY GUN OR PISTOL.—F. Fuller, New York city.

I claim the combination of the discharging-rod, C, constructed with a grooved head, b, the spring chamber, a', substantially as set forth. The wedge-shaped trigger, E, arranged to elevate and release the discharging rod, C, and the shoulder, c', with the stop, g, and depressing spring, h, all constructed substantially as set forth and described.

71,733.—DRESS FOR MILLSTONE.—A. N. Garland, West Charton, Vt.

I claim the millstone dress above described, consisting of the smooth surface inside, and the file surface outside of the line, D, together with the smooth shallow channels in the bed stone, and deeper ones in the runner, the channels in both stones being constructed in the curved form above described, widening towards the rim of the stones, and having one smooth inclined surface and one perpendicular wall, c', the upper edge of the wall being sharp and smooth, and all the parts being constructed and arranged substantially in the manner and for the purposes specified.

71,734.—PLOW.—George Gibbs, Canton, Ohio.

I claim, 1st, The straight beam, a, in combination with the detachable wooden brace, b, fitted into sockets, for the purpose as herein specified.

2d, The land side, d, of the form and for the purposes as set forth.

3d, The colter nose, e, made and used as and for the purpose specified; and

4th, The beam, a, brace, b, land side, d, and colter nose, e, combined to form the design specified, when made and used as herein described.

71,735.—PLOW.—William Gibbs, George Gibbs, and Louis P. Wikidal, Canton, Ohio.

We claim the flange on cast shares, when constructed and used as herein-before described.

71,736.—FENCE.—Samuel Good, Greensville, Ohio.

I claim the blocks, A and B, when constructed substantially as described, having a suitable base, C, and formed into a fence, as specified.

71,737.—RAILROAD GATE.—A. C. Goodman, and Henry Fesler, Canton, assignors to themselves and Henry Foltz, Stark County, O.

We claim, 1st, The gate, C, provided with a weight, D, which causes it to assume a vertical position when not confined, as and for the purpose set forth.

2d, The arrangement of the crank shafts, E, with their bars, F, connecting-rods, G G, and the gate, C, as and for the purpose specified.

3d, The arrangement of the spring notched bar, H, with the crank shaft, E, and gate, C, as and for the purpose set forth.

71,738.—REGULATOR FOR MARINE CLOCKS.—A. I. Goodrich, Waterbury, Conn.

I claim a regulator for marine clocks, made of one piece or strip of metal from end to end, substantially as described.

71,739.—BAG TIE.—John J. Gordon, Flint, Mich.

I claim the bar, A, hook, B, and cord, C, constructed, combined, and used, substantially as and for the purpose set forth.

71,740.—BALING PRESS.—Jackson Gorham, Bairdstown, Ga.

I claim the arms, I, constructed as described, having diverging side pieces, b b, the bottoms of said arms resting in grooves of the framing, d, and attached to the ends of the rope, J, which passes over the pulleys, e, in the end of the lever, H, to the shaft, C, all arranged and operating as herein described.

71,741.—SHAFT ATTACHMENT TO CARRIAGES.—Jackson Gorham (assignor to himself and John Armstrong), Bairdstown, Ga.

I claim the attachment to carriage shafts, consisting of rods having hooks, and hung to the whiffletree and sliding hooks, substantially as and for the purpose described.

71,742.—APPARATUS FOR MAKING PAPER ARTICLES.—Harrison Grambo, Philadelphia, Pa.

I claim, 1st, Forming articles from paper pulp, complete by continuous operations, substantially as described.

2d, The feed and agitator box, G, substantially as described, for the purpose specified.

3d, The interlacer, E, substantially as described, for the purpose specified.

4th, The cone, I, and flexible former, K, substantially as described, for the purpose specified.

5th, The cords, p, and windlass, n', or equivalents, in combination with the former, K I, substantially as described, for the purpose specified.

6th, The blocking mechanism, L M N, substantially as described, for the purpose specified.

7th, The drying and pressing cylinder, N', in combination with the blocking mechanism, L, and blast apparatus, O, substantially as described, for the purpose specified.

8th, The flocking device, U V, substantially as described, for the purpose specified.

9th, The series of set screws, S, arranged in circular form, carrying cam rollers, T, on swivel arms, u, for the purpose substantially as described.

10th, The combination and arrangement of the various devices and parts herein described, or their equivalents, operating in the manner and for the purpose substantially as described.

71,743.—MEDICATED BALSAM.—Lucia F. Griffin, New York city.

I claim a medicated balsam composition, of the ingredients herein named, as and for the purposes set forth.

71,744.—DISTILLING APPARATUS.—Theodore Grundman, Cleveland, Ohio.

I claim, 1st, The vessel, B, when connected with the upper part of the retort, by means of pipes, a and B, and when provided with a dish-shaped cooling cover, substantially as and for the purpose herein shown and described.

2d, The retort, A, and vessel, B, when made and arranged as set forth, in combination with a cooler, E, as described.

71,745.—SASH STOP.—James R. Hall, Georgetown, Ill.

I claim the combination of the spring, E, and lever catch, G, and eccentric roller, I, substantially as and for the purpose described.

71,746.—STREET PAVEMENT.—Alexander Hamar, New York city.

I claim, 1st, The method herein described of paving streets by the employment of small blocks of wood glued together to form sections of about four feet square, which sections are arranged side by side upon a bed composed of sand, lime, and silicate of soda, with spaces between the sections to be filled with asphalt, as hereinbefore described.

2d, Also, the combination, as described, of the small wooden blocks glued together in sections, the mortar foundation, the parallel timbers underlapping the joints of the sections, and the asphalt filling between the sections, for the purposes set forth.

71,747.—GRADING AND EXCAVATING MACHINE.—T. C. Hammond, Nicolaus, Cal.

I claim, 1st, The construction of a plow with an angular upright standard, having a sole plate and wing, and a mold board and share, together with all the connecting parts, substantially as described, for the purpose specified.

2d, A double plow of the above description, all of the different parts of which are reversed and pointing and facing in opposite directions, and connected by a continuous beam and furrow bar.

3d, The peculiar circular bevelled shape of the apron frame plate, 2, by means of which the apron frame is closely fitted to the under side of the mold board of the plow.

4th, The construction of a double-acting traction horse-power, working upon two wheels with separate reversed parts, the whole being so constructed as to work in opposite directions without turning.

5th, The construction of the wooden extension bridge, before described, for the purpose before described.

6th, The different parts of said machine, when combined, as forming in whole a machine so constructed as to work in opposite directions upon the same side of a given line or embankment without turning.

71,748.—HANGING TEA-KETTLE LID.—C. C. Hare, and S. J. Hare, Louisville, Ky.

We claim, 1st, Making a tea-kettle with a swinging lid in two pieces, connected and operating as herein described.

2d, A swinging lid, having a curved or semi-circular slot, c, in the rim, b, in combination with the ear, c, the bail, d, and the pin, a, of a tea kettle, arranged and operating as herein described.

71,749.—FIELD DERRICK.—Isaac J. Hattabough, Santa Clara County, Cal.

I claim, 1st, The double sheaves for the operating line,

2d, The pivots and plates at top and bottom of the pole, for the guys and pole swivel.

3d, The combination of the sheaves, H, with the pivots to plate, H, in combination with operating rope, E, pole, A, arm, B, adjuster, D, guys, J, to make a simple and complete combination for a derrick for field purposes, as described, and substantially as set forth.

71,750.—FENCE.—C. Augustus Haviland, Davenport, Iowa.

I claim 1st, The arrangement and combination of boards, blocks, and posts in the manner and for the purpose herein set forth.

2d, The construction of a fence post, with slot or aperture, C, in the manner and for the purpose herein described.

71,751.—PILL AND OTHER BOXES.—George H. Hawkins, New York city.

I claim forming pill or other boxes of buckram, or other woven fibrous material, stiffened with starch or other glutinous material, and struck up into proper shape while moist or damp, by means of hot metal dies, substantially as herein shown and described.

71,752.—COMPOSITION FOR COATING WOODEN STRUCTURES.—Joseph Heckel, Decatur, Ill.

I claim the composition above described, when compounded and used substantially as and for the purposes specified.

71,753.—STEREOSCOPE.—Alexander Heilbrun, Cincinnati, O.

I claim, 1st, The arrangement of the two shafts, G and H, endless chains, J, fingers, L, arms, Q R, roller, O, and catches, X, in the described combination with the series of slides secured to one or more endless ribbons, T, in the manner and for the purpose set forth.

2d, In the described combination, the fingers, L, groove, h, roller, O, arms, Q and R, and the catches, X, for the purpose set forth.

3d, In combination with the elements of claim, 1st, I claim the springs, g, for holding the slides to the under side of the open frame, F.

4th, The guard or partition, Z, curved upward at its front end, as and for the purpose stated.

5th, The hinged and folding foot, l, having the bracket, j, and screw, k for the purpose set forth.

71,754.—MANUFACTURE OF IRON.—David W. Hendrickson, New York city.

I claim the use of zinc or zinciferous ores, manganese, or the Franklinite ores, as a flux or a mixture in iron-furnaces, in combination with the compound blast of superheated steam and air for manufacturing iron suitable for the Bessemer process of and for manufacturing steel and other purposes, substantially in the manner and for the purpose herein set forth, and shown in the accompanying drawings.

71,755.—LIFE PRESERVER.—D. H. Heyen, New York city.

I claim the air tube, B, in combination with the belt, A, attached and arranged substantially as shown and described for the purpose set forth.

71,756.—NOZZLE FOR FIRE ENGINES, ETC.—J. J. Hofer, New Orleans, La.

I claim an air chamber, in combination with the nozzle, constructed and operating substantially as and for the purpose described.

71,757.—DRY GAS-REGULATOR.—J. B. Hoffman, Philadelphia Pa.

I claim 1st, A bellows like receiver, H, applied to a gas regulator, and connected to the valve of the latter substantially as described, so that as the pressure of the gas varies, the receiver will expand or contract, and the opening for the passage of the gas will be increased or diminished in size.

2d, The chamber, I, and its tight detachable cap, j, arranged on the top of the regulator in respect to the weights, x, as and for the purpose set forth.

71,758.—APPARATUS FOR IRONING CLOTHES.—C. R. Hoyt, New York city.

I claim 1st, The ironing table, B, whose free end rests upon the posts, L, and spring, K, ironing roller, D2, upon shaft, S, revolving in contact with the curved fire plate, E2, fan blower, W, and driving shaft, P, all arranged as described for the purpose specified.

2d, The ironing table, B, pivoted to the frame, A, at one end, and whose outer end rests upon the posts, L, and spring, K, as and for the purpose specified.

3d, The combination of the fan blower, W, with the yielding spring ironing table, B, ironing roller, D2, and fire-pot, B2, substantially as described for the purpose specified.

4th, The arrangement upon the frame, A, of the driving shaft, P, pinion wheel, Q2, shaft, S, wheels, R T U, fan blower, W, grooved roller, N, cord, O, furnace, B2, ironing roller, D2, curved fire plate, E2, yielding ironing table, B, as herein set forth for the purpose specified.

71,759.—TIRE FORGE HEATING APPARATUS.—Jos. R. Humphreys, Pennsville, N. J.

I claim the casing, B, and box, A, constructed for the reception of a tire, and for application to a smith's forge, substantially as described.

71,760.—WASHING MACHINE.—Eli Hunt, Shelburn, Ind.

I claim an improved clothes-washing machine, consisting of the open cylindrical clothes- receptacle, C, provided with the litters, f, and rods, d, fitted within the cylindaical suds-box, A, the hinged doors in the hinged top of the suds box, and cylinder, all constructed, arranged, and combined to operate as described and specified.

71,761.—STEAM ENGINE GOVERNOR.—R. K. Huntoon, (assignor to himself and Charles S. Lynch), Boston, Mass.

I claim the arrangement and combination of the lever, e', rod, f', and weight, b', with the shaft, B, its propeller or propellers, D, the vessel, A, the ratchet, r', sectional frame, s, the pawls, t u, the rocker frame, b', and its cams or lifters, c' d', such ratchet being applied to a shaft, d, and the whole being substantially as specified.

Also, the combination and arrangement of the oil receiver, c, its eduction hole, e, and air pipe, f, with the governor as described.

71,762.—WINDLASS FOR BOATS.—Edgar Huson, Ithaca, N.Y.

I claim 1st, Making a boat windlass by the use of the slotted plate, E, about the shaft, G supported on the vibratory standards, K and F, and having the clicks, C and D, which act in the described manner on the ratchet or cog-wheel, B, and head, A, thus producing by both the forward and backward motions of the lever, one and the same motion of the rope, cable, or chain, as described.

2d, The combined whole, made as figured and described, for the purpose of a convenient and useful windlass for boats and other similar craft as described.

71,763.—HARPOON.—Zeno Kelley, New Bedford, Mass.

I claim the harpoon herein described, with rubber spring, C', on the end of the shaft, spiral spring, D', on the shaft, and stop, F', on the blade, and side, E', on the shaft, or their equivalents, constructed and operating substantially as herein set forth and described.

71,764.—HAY RAKER AND LOADER.—Henry Kewley, Perry, Ohio.

I claim 1st, The raking device herein described, consisting of the series of movable and independent rake teeth, S, rake head, P, provided with apertures, side pieces, O O, rail, Q, journals, R R, stop pins, T, arm, T2, and pendent rods, T3 T4, all arranged and operating as and for the purpose herein specified.

2d, The said raking device, constructed as herein described, in comoination with the conveyers, J, provided with sets of lines, K, and bands, I, as and for the purpose set forth.

3d, The pivoted apron or broad chute, U1, constructed with a series of fingers, U3, and turned-up sides, U2, supports, U, and cords, W, arranged and operating as and for the purpose specified.

71,765.—APPARATUS FOR LEACHING BARK.—Chas. Korn, Wurtsborough, N. Y.

I claim 1st, The vessel, A, when divided by means of partitions, B B, into various compartments, which are connected by means of pipes, H, with a perforated trough, G, the latter being also subdivided by means of partitions, substantially as set forth, all made and operating so that a constant circulation of the tanning liquid may be established between all the compartments, as herein shown and described.

2d, Providing the partition of the trough, G, with gates, and the pipes and holes, arranged in the bottom of the trough, with plugs or valves, substantially as described, so that the contents of some of the compartments may be made to circulate, leaving those of the other comparments intact, as set forth.

71,766.—INKSTAND.—Rufus Lapham, New York city.

I claim an inkstand, made substantially as described.

71,767.—PORTABLE FENCE.—Sebastian Leonard, Jr., Fairfield county, Ohio.

I claim the combination of the posts, A B, the keys, C C', brace, D, and cross ground-sill, E, all constructed and arranged substantially as and for the purpose described.

71,768.—BLEACHING VEGETABLE OILS.—Theo. Leonhard, Paterson, N. J.

I claim the vessel, A, containing a revolving shaft, E, with wings, D, or their equivalents, substantially as described, for the purpose of bleaching and preparing vegetable oils as set forth.

71,769.—RAILROAD SWITCH.—H. C. Lewis, Miller Township, Pa.

I claim the chains, provided with bolts, which pass into cross ties for securing the rails, J K, and allow the same to be moved laterally, as and for the purposes set forth.

71,770.—EYE GLASSES AND SPECTACLES.—Henry Lomb, New York city.

I claim the elastic bands or straps, a, in combination with an eye glass or spectacle frame, when such bands or staps are fastened to the frame only at or near their ends, and between such points are left free of the frame, with an opening or space between, substantially as described for the purpose specified.

71,771.—HOISTING MACHINE FOR STACKING HAY.—William Louden, Fairfield, Iowa.

I claim 1st, In the construction of a hay-elevating device a derrick, composed of two flexible supporting frames, so arranged that they shall be expanded sufficiently to allow a load of hay to pass through between them, or contracted so as to pass through an ordinary farm gate, substantially as described.

2d, Supporting an elevated bar, B, by means of two independent supporting frames, one of which is securely braced to it, so as to impart sufficient rigidity, while the other is loosely pivoted, so that as the base of the derrick is extended or contracted, the inclination of the bar, B, will be varied, for the purpose of preserving the proper inclination of the bar on slanting ground, and to facilitate the labor of putting up or taking down, substantially as shown and described.

3d, In the arrangement for conveying the hay over the stack or other place where it is to be deposited, I claim the combination of the travelling pulley C, provided with a frame which straddles the bar upon which it works, the latch, D, applied to the frame of the traveling pulley and working into a notch or catch on the under side of the bar, as herein shown and described.

4th, Placing the drum, G, in a frame, F, connected to the derrick by joints or hinges, h, so that in hauling or moving the derrick it may be turned over in the center substantially as and for the purpose set forth.

5th The pulleys, n m', or the hoisting power frame, l, the pendent hook, s on the sweep, p, in combination with the pivoted arm, o, all arranged to operate in the manner substantially as and for the purpose set forth.

6th, Arranging the hoisting or elevating power, H, on the runners, I I, of the supporting frames, and securing it in this position to render the derrick rigid, substantially as herein shown and described.

71,772.—SPRING FOR DOOR.—Josiah J. Makey, South Brooklyn, New York.

I claim the spring constructed as described, of the parts, A B, secured to the door frame, substantially as described and for the purpose specified.

71,773.—PRESSURE GAGE.—James W. Maloy, Boston, Mass.

I claim 1st, The combination with a flexible diaphragm of the button, e, and stem, e', the lever, i k, and spring, k', as specified.

2d, The combination of a single lever, i k, rack, l, sliding cross piece, m, attached to the standard, g, and pinion, n, as and for the purpose set forth.

3d, The standard, g, and the support, f, and cross-pieces, h, in connection with the operative parts of the gage so constructed and arranged as to enable them to be easily removed from the casing, b, by simply unscrewing the ring, s, substantially as set forth.

4th, The attachment of a gage to the top plate of a fire extinguisher, substantially as specified.

71,774.—WAGON WHEEL.—Jared Maris, Athens, Ohio.

I claim 1st' The groove in the hub into which the spokes are fitted.

2d, The manner of fitting the spokes together in a solid ring by tongue and groove.

71,775.—APPARATUS FOR HAND AND YOKE LIFTING.—Morris Mattson, New York city.

I claim 1st, In combination with mechanism or apparatus adapted for hand or yoke lifting, singly or together, the use and application of a platform scale, operating substantially as and for the purposes set forth.

2d, The application and arrangement, in machines or apparatus for hand and yoke lifting, of the cresent, b b, or its equivalent, with suitable handles, b' b', in combination with the standard, B, substantially as and for the purposes set forth.

3d, So connecting such crescent, b b, and its standard with any base or support, by a male and female screw, or their equivalent, that the cresent can be raised or lowered, for the purposes set forth.

4th, The construction and arrangement of the adjustable yoke, E, substantially as and for the purposes set forth.

5th, In combination with such a yoke, or its equivalent, the arrangement of the ring, F, and variable chains, G, substantially as and for the purposes set forth.

6th, In combination with a yoke, E, for lifting, the arrangement of the adjustable hand rests, I I, substantially as and for the purposes set forth.

7th, The combination with a platform scale, of mechanism or apparatus for hand and yoke lifting, singly or together, when constructed as described, and for the purposes set forth.

71,776.—FURNACE FOR ROASTING AND REDUCING ORES.—Jabez Maunton, (assignor to himself Wright Duryea, Wm. Ennis, J. H. Van Riper, A. P. Cummings, and J. Wendell Cole), New York city.

I claim 1st, The combination in connection with a reversible draft in or through them substantially as described, of reducing chambers, E E, and an intermediate fuel chamber, F, severally chargeable from above, and communicating with each other at or near the base essentially as and for the purposes herein set forth.

2d, The combination, with a reversible draft essentially as specified, of regenerators, D D, reducing chambers, E E, and fuel chamber, F, connecting with the reducing chambers by passages at or near their base, and chargeable as well as the reducing chambers from above, for operation as herein set forth.

3d, In combination with a reversible draft and fuel and reducing-chamber or chambers, the vertical regenerators, D D, having their inlet and outlet passaegs connecting with the draft, arranged below substantially as described.

4th, The connection of the reducing chambers, E E, with each other by a covered passage, G, arranged to pass through an intermediate fuel chamber, essentially as herein set forth.

5th, The arrangement in connection with the reducing chambers, E E, of an air pipe or passages, J, arranged to connect said chambers at or near their top, substantially as and for the purpose specified.

71,777.—MINERAL WATER.—Chas. E. Michel, (assignor to Frederick Von Phul), St. Louis, Mo.

I claim the mode of producing carbonated chalybeate water hereinabove described it being an artificial chalybeate water, containing the carbonate of the protoxide of iron.

71,778.—MUSKETO-NETS IN WINDOW BLINDS.—G. W. Miles, Philadelphia, Pa.

I claim the compound window-blind slats, B B, in combination with the musketo netting, b b, constructed arranged, and operating substantially as and for the purpose herein described.

71,779.—RETAINING AND RELEASING HOOK.—Geo J. Neveil, Philadelphia, Pa.

I claim the construction and arrangement of the hanger, A, link, e, and hook, f, substantially as and for the purpose described.

71,780.—APPARATUS FOR EXTERMINATING VERMIN.—M. V. Nobles, Elmira, assignor to himself and John C. Nobles, Rushford, N. Y.

I claim 1st, The fan blower, A, the furnace, F, and the vessel, G, with the parts thereunto connected, arranged, combined, and operating substantially as described for the purpose specified.

2d, Forcing a current of heated gas, vapor or air, either with or without annihilating powders or other substances in combination therewith, from the vessel, G, or its equivalent, substantially as and for the purposes described.

71,781.—WATER ELEVATOR.—Alonzo Norris, Spencer, N. Y.

I claim the reservoir, A, movable bottom, D, and valve plug, E, all combined and arranged together, substantially as and for the purpose described.

71,782.—CANDLESTICK.—Harrison Ogborn, Richmond, Ind.

I claim 1st, The hinged part, a, provided with the match-box, C, fitting into the body, A, of a candlestick substantially as described.

2d, The holes, i, in combination with the partition, d, of the body, A, of a candlestick, substantially as and for the purposes described.

3d, The combination of the hinged part, a, box, C, partition, d, holes, i, and spare end, D, with the body, A, of a candlestick, substantially as and for the purposes described.

71,783.—METHOD OF SAVING AND UTILIZING THE ALKALINE LIQUORS USED IN TREATING STRAW, WOOD, ETC.—Stoughton Pettebone, Niagara Falls, N. Y.

I claim, 1st, The saving and utilizing of the alkali liquor, after it has been once used (employed by paper manufacturers in subduing or subjecting straw, wood, or other fibers), by transferring the same from one boiling rotary or vessel to another, and strengthening it by the addition of fresh alkali liquor, substantially as above stated, instead of recovering the soda ash from the waste liquor by a separate process well known to the trade, or wasting it absolutely, as is generally practised.

2d, The mode above indicated of transferring the said alkali liquor from one rotary to another, while hot, by forcing the same under, and by the pressure of steam used in boiling the material, substantially as above described.

3d, As another mode of accomplishing the same result, the use of the principle of a vacuum formed in the vessel or rotary to which the said waste alkali liquor is to be transferred, by means of an air pump, and thus transfering the liquor and steam by atmospheric pressure, substantially as above described.

4th, The saving of the waste alkali liquor by transferring the same into a receiving tank or vessel, to be used over again in boiling paper stock, substantially in the manner above indicated.

71,784.—WOOL CARDING MACHINE.—Stephen C. Philbrick, Rockville, Conn.

I claim the rolls, G F, in combination with the rolls herein described, attached to a first breaker card, all constructed, arranged and operating as set forth.

71,785.—LOG WAGON.—I. S. Pigott, Central Station, West Va.

I claim the log wagon, constructed as described, having the frame, B, upon the axle, A, and provided with the dogs grasping the timber, all operating as described, whereby the depression of the tongue, D, raises the timber and places it upon the axle, A, and within the frame, B, as herein described, for the purpose specified.

71,786.—ROTARY PUMP.—John Poppe, Green Point, N. Y.

I claim, 1st, The combination of the flanged plates, a1 and a2, of the case, A, interior gear wheels, B and E, and piston head, H, with each other, said parts being arranged substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the valve, L, operated from the drive shaft, F, to allow the piston head, H, to pass, and dropping again into place in the rear of the said piston head, to close the passage, G, substantially as herein shown and described.

3d, The combination of the gear wheel, V, gear wheel, T, having a projection or cam, X, formed upon its side, and vertical sliding or lifting bar, P, having an inclined shoulder, p', formed upon its side for the cam to operate upon, with each other and with the drive shaft, F, and valve L, substantially as herein shown and described, and for the purpose set forth.

71,787.—COMPOSITION FOR PRESERVING ANIMAL INTESTINES.—Thomas L. Reed (assignor to the Atlantic Tubing Company), Providence, R. I.

I claim the use of glycerin and the several commodities herein enumerated in compound, substantially as and for the purpose specified.

71,788.—HORSE HOLDER.—John P. Reynolds, Mirabile, Mo.

I claim, 1st, The construction of the holder for horses, consisting of the wide body band, M, having the front and rear straps, N D, the upper end of the body band, M, secured to the platform having the central post, J, passing loosely through the cross bar, C, and elevated by means of the pulleys, K, rope, L, and windlass, P, all arranged and operating as herein described, for the purposes specified.

2d, Also the swivelled rest blocks for the horse's hoofs, arranged in grooves or ways, substantially as described.

71,789.—LAMP CHIMNEY.—E. B. Requa, Jersey City, N. J.

I claim a lamp chimney of flat form, or wider in one direction than in the other, with the flat sides made concave, and the upper part of the chimney, above the lower bulb part, made with a gradual taper, substantially as herein set forth.

71,790.—BASIN FAUCET.—Francis Roach (assignor to himself and Joseph Zane), Boston, Mass.

I claim the combination and arrangement of the valve seat case or the head extension, R, and its cap, H, with the faucet body, F, the valve, A, its operative screw, G, and spring, c.

Also, the combination as well as the arrangement of the valve case, D, with the valve seat case, R, its cap, H, the faucet body, F, the valve, A, its operative screw, G, and spring, c, the whole being constructed substantially in the manner and so as to operate as specified.

71,791.—SCAFFOLD.—Clark Robinson, Rochester, Minn.

I claim, 1st, The uprights, A, when provided with notches, a a, in combination with the spring bolts, F, and lever, e, for the purpose of supporting the platform, and for lowering the same when required.

2d, The windlass E, in combination with the frame, A, platform, D, and spring bolts, F, all made and operating substantially as and for the purpose herein shown and described.

71,792.—HAY RAKER AND LOADER.—Andrew Royse and Matthias K. Morris, Le Roy, Pa.

We claim, 1st, In combination with the rake teeth hinged to the main frame by levers, E E', the slotted and shouldered standards, G G', for guiding the rake in its rising and falling motions, and sustaining it from going too low, substantially as described.

2d, In combination with a rake for gathering the hay, a conveyor for taking and carrying up the hay, when used with teeth that are thrown out of and drop into said conveyer, first to take and carry up and then to deliver the hay, substantially as described

3d, In combination with the carrying teeth that are projected from and drop within the conveyor, the metal bed, g, for guiding and holding the teeth, substantially as described.

71,793.—MACHINE FOR CUTTING PAPER.—Geo. H. Sanborn, Boston, Mass.

I claim, 1st, Operating the knife by connecting it with the crank, X, in the manner described.

2d, In a paper cutting machine, the combination with the gage of rod, r, index, t, and graduated scale, s, in the manner and for the purpose set forth.

3d, The arrangement of gearing herein described, for regulating the speed of the knife, giving a slow movement on its downward stroke, and a quick movement on its upward stroke, as set forth.

11,794.—CULTIVATOR.—Jared W. Sanford, Byron, Ill.

I claim, 1st, The adjustable standards, B, attached to the plow beams, A, and braced by bars, D D', in the manner substantially as and for the purpose herein set forth.

2d, The attaching of the plows, or shares, E, to the standards, B, by having the former at the lower ends of cylindrical rods, c, fitted in staples, d, at the front sides of the standards, substantially as and for the purpose specified.

3d, The combination of the hoe, rake and roller, with a cultivator, when all are constructed, arranged and applied to admit of either the plows or the hoe, rake, or roller, being used by simply inverting the implement, as set forth.

71,795.—TAG.—Frederick G. Sargent and Norman H. Bruce, Graniteville, Mass.

We claim the application to the cross metal wire or band, C, or its equivalent, of a coating of suitable material for uniting such band with the card paper of a tag, substantially as described.

71,796.—GRAIN SEPARATOR.—Abram Schenck, Ovid, Mich.

I claim the combination of the frame, A, with the cross beams, B B, the shaft, C, the hubs, D D D, and the wings, I I I, of the fan, the pulley, E, the hoppers, F M1 M2 M3, the flues, N N N, the conductors, O O O, the depressed boxes, K K, the bottom valves, L L L, the weights and cords, J J J, and the valves, G G G, or their equivalents, all arranged substantially as described for the purpose designed.

71,797.—WOODEN WAGON SPRING.—Anson Searls, San Francisco, Cal.

I claim an endless wood spring and perch in combination substantially as set forth and described.

71,798.—MACHINE FOR BUNDLING WOOD.—Daniel D. Sherwood, Boston, Mass.

I claim, in combination with the table, c, the hinged jaws, f, having bolts for confining them together, and springs for throwing them apart, arranged substantially as and for the purpose set forth.

Also, the arrangement of the two sets of jaws, with the shelf or shelves, and space between, substantially as and for the purpose set forth.

Also, in combination with the lower jaws and their expanding springs, the treadle, arranged to bring them together, substantially as described.

71,799.—SALIVA PUMP.—A. M. Shurtleff, Boston, Mass.

I claim combining with the suction or mouth piece of the saliva pump, an elastic valvular pump or bulb, connected at one end to the mouth piece by a rigid tube, and having attached to its opposite end a flexible pipe leading to the saliva vessel, substantially as shown and described.

Also, making the induction or suction end of the pump of hard rubber, or equivalent material, substantially as described.

Also, so connecting the discharge pipe with the saliva vessel, by means substantially such as described, that it cannot be withdrawn therefrom by the working or movements of the pump.

71,800.—HAND TRUCK.—Thomas A. Slack (assignor to himself and Chauncey Nye), Peoria, Ill.

I claim, 1st, The teeth or projections on the forward end of the body of the truck.

2d, The adjusting shovel, provided with the blade, h, the side piece, B, the slot, d, the projection, e, the foot guide, a, and the cross bars, c and i.

3d, The axle or pivot bar, b, when all shall be constructed, combined, arranged and operated as and for the purpose set forth and described.

71,801.—WAGON HUB.—Samuel W. Slocumb, Albany, Ill.

I claim, 1st, In combination with the hub, A, formed with an internal annular projection, A', two spindles, C C', and the axle, B, when the latter is attached to the spindle in front of their centers, substantially as and for the purpose set forth.

2d, The spindles, C and C', when attached to the axle as set forth and formed with a bearing, D, or friction roller, E, substantially as set forth.

3d, The spindles, C and C', when their sides are constructed with curves of different radius and they are arranged to operate substantially as and for the purpose set forth.

71,802.—WAGON BRAKE.—George P. Smith and John Desso, Lake City, Minn.

We claim the bar, G, pivoted to the under side of the front axle and provided with a slot for the bolt, J, and a series of holes through which the bars or rods, H and F, connect with it for operating the brake blocks through their bar, D, as and for the purpose set forth.

71,803.—LOW-WATER INDICATOR.—Levi F. Smith, Philadelphia, Pa.

I claim the arrangement of the part, D, recess, a, washer, C, cross bars, e, pipe, A, and whistle, B, substantially as herein set forth.

71,804.—BED BOTTOM.—Samuel A. Smith (assignor to himself and Edwin E. Woodman), Monroe, Wis.

I claim, 1st, The end springs, A A, in combination with rods, C C, substantially as described.

2d, The coil springs, d d, rods, C C, springs, A A, slats, D D, and webbing, f f, all combined substantially as specified.

71,805.—CARRIAGE.—Ephraim Soper, New York city.

I claim, 1st, The front perch, K, secured or swivelled to the top bed and back bar, or either, and pivoted with its rear end or ends to ears, g g, which project from the under side of the carriage body, substantially as herein shown and described.

2d, The combination of the front perch, K, when the same is made and operating substantially as herein shown and described with the ears, g, back bar, J, top bed, F, and C-springs, M, all made and operating substantially as set forth.

3d, The king bolt, I, when formed on and suspended from the under side of the upper transome plate, substantially as herein shown and described.

4th, The oil hole, c, in the upper transome plate, when arranged as described, to convey oil to the king bolt which is suspended from and formed on the upper transome plate, substantially as herein shown and described.

71,806.—BRIDLE BIT.—Jacob Spoonhour, Green Township, and Samuel R. Boyd, Chambersburg, Pa.

We claim the elliptical-shaped side piece, marked A, the clasp or bearing, marked B, the roller, marked C, and the screw or rivet, marked D, as represented on the accompanying drawing and hereinbefore explained and set forth.

71,807.—RAILROAD SWITCH.—W. H. Staats, Crescent, N. Y.

I claim the combination of the shifting bar, D, and hinged switch bars, C, arranged to operate in relation to the rails of the track and siding, substantially as set forth.

71,808.—SPRING BED BOTTOM.—Edward Steinel, Amsterdam, N. Y.

I claim, 1st, The bolts, c, and segmental cages, e, in combination with the springs, B, substantially as and for the purpose described.

2d, The C-springs, I, and hinged braces, K, in combination with the head piece, H, constructed and operating substantially as and for the purpose described.

71,809.—SPINDLE BOLSTER.—F. A. Sterry, Canton, Mass.

I claim, 1st, The absorbent or strainer in the bolster, B, consisting of rings fitting snugly around the slotted central part of the bolster and placed in the annular recess, a, and of less diameter than said recess, whereby the lubricant surrounds the circumference only of the absorbent and is strained through said absorbent to the spindle, as herein shown and described for the purpose specified.

2d, In combination with the absorbent or strainer as described placed in the recess, a, the screw cup, D, fitting air tight upon the top of the bolster, whereby a valve is produced which by screwing up or unscrewing regulates the quantity of oil to be strained through the absorbent to the spindle, as herein set forth for the purpose specified.

71,810.—COMPOSITION FOR POLISHING KNIVES.—Aaron W. Stewart, Middletown, Ohio.

I claim the polishing powder consisting of equal parts of the articles specified, when applied and used with the prepared cork, in the manner and for the purposes described.

71,811.—MILL PICK.—Uzziel Stewart, Berlin, Wis.

I claim the stock, A, in combination with the grooved plate, E, key, F, plate, C, and set screw, B, all constructed and arranged to secure the cutter in the stock, substantially as shown and described.

71,812.—FOLDING GLASS FOR PLANTS, HOT BEDS, ETC.—J. St. John, Stamford, Conn.

I claim, 1st, The two glasses hinged or pivoted together and furnished with the flexible end pieces, substantially as and for the purpose specified.

2d, The combination of the glasses, B, hinged frames or sashes, A, and flexible end pieces, substantially as and for the purpose specified.

71,813.—BRICK MACHINE.—Thomas Stone, Plainfield, Ind.

I claim, 1st, The rollers, I I, operated from the mud-mill shaft, C, by means of the gearing, G H H, in combination with the molds, F, operated from the rollers, I I, by the toothed rims, dx, and racks, e, all arranged substantially as and for the purpose described.

2d, The roller frames, L, carrying their molds when placed on springs, f when used in connection or combination with the rollers, I I, substantially as and for the purpose set forth.

71,814.—WOOD-PLANING MACHINE.—Anton Streit and Henry Streit (assignors to I. A. Fay & Co.), Cincinnati, Ohio.

We claim the removable glass facing, C, of the bed of a wood-planing machine, when constructed and applied substantially as and for the purposes described.

71,815.—CORN HARVESTER.—J. B. Sweetland, Pontiac, Mich.

I claim, 1st, The frame, A, with axle, B, ratchets, K K, and pulleys, M M, arranged for operating the spring knives, G G, and reels, F F, in the manner and for the purposes set forth.

2d, The knives, G G, in combination with the L-shaped knives, H H, reels, F F, guides, d, and springs, b b, or their equivalents, all constructed, arranged and operating substantially as and for the purposes herein set forth.

71,816.—HARVESTER RAKE.—J. B. Sweetland, Pontiac, Mich.

I claim, 1st, The rake, H, and arms, G and F, used with the wheel, D, and platform, B, and operating substantially as and for the purpose set forth.

2d, The guide, P, and pallet, Q, arranged in combination with the arms, F and G, and platform, B, all constructed and operating as specified.

3d, The arrangement of foot piece, Y, with the bars, O and N, rod, L, lever, M, and sleeve, K, for throwing the rake in gear at the time the grain is dropped, substantially as herein represented.

71,817.—CUTTER HEAD FOR DRESSING MOLDINGS.—Joseph Temple, Terre Haute, Ind.

I claim a molding cutter composed of a series of revolving disks each one of which has on its cutting edge the form of the section of the molding to be cut the several disks that form the series so arranged that, as a whole, they form a complete cutter to cut the molding, all constructed to operate substantially as described.

71,818.—STITCHING CLAMP.—Joseph Temple, Terre Haute, Ind.

I claim, 1st, The jaws, A and B, constructed substantially as represented, hinged together and operated upon by means of spring, G, as and for the purpose set forth.

2d, The tongue, C, used in combination with the jaws, A and B, and regulated substantially as and for the purpose set forth.

71,819.—HARNESS MOUNTING.—C. M. Theberath, Newark, N. J.

I claim the end of the hook, A, and lining, B, provided with a screw thread upon which the top, D, is screwed to retain said lining in position against the hook, as herein shown and described.

71,820.—DEVICE FOR TRANSMITTING MOTION.—Nathaniel Thompson, Farmington, Mich.

I claim, 1st, The arrangement of the parts, A B, parallel bars, b b, racks, c c, slide, C, pinion, D, with its shaft, E, plate, F, and rod, k, as herein described for the purpose specified.

2d, Giving the lateral oblique movement to the part, B, of the frame by means of the oblique slots, f h, and the bolt, e, and projection, g, working respectively therein, the bar, k, connected with the slide, C, and the projection, g, of the part, B, substantially as and for the purpose set forth.

3d, The spring, n, arranged or applied substantially as shown, to exert a pressure on the bar, k, and the bent rods, o o, arranged in relation with the spring, n, projection, g, and the ends of the oblique slot, h, to relieve the bar, k, of the pressure when required.

71,821.—ADJUSTABLE SEAT FASTENER.—Walter T. Thornton (assignor to himself and Alexander D. Wright), Belleville, Mich.

I claim the construction of a wagon seat fastening substantially as described, with plate, A, projections, B B, etc., cap, C, rack, D, provided with seat rest, E, the catch, F, and the spring, G, or their equivalents, for the purpose set forth.

71,822.—BURGLAR ALARM DOOR LOCK.—Ezekiel Tracy, Kansas City, Mo.

I claim the combination of the lever bar, B, and supplementary bolt, Q, when arranged between the mechanism of a lock and a suitable alarm, for operating substantially as and for the purpose described.

71,823.—FORGE HAMMER.—Benj. Walker, Greenpoint, N. Y.

I claim, 1st, The combination with a power hammer having a spring or elastic and flexible device interposed between the driving gear and hammer proper to operate the latter, of mechanism consisting of the lever, K, slide, J, rod, I, and spring, m, or their equivalents, for changing the position of the fulcrum of said flexible device to vary, while at work, the stroke of the hammer without altering its velocity, all constructed and arranged substantially as specified.

2d, The arrangement and combination of the lever, K, slide, J, provided with crooked slot, s, rod, t, and bar, n, for action on the friction block, r, substantially as and for the purpose set forth.

3d, The cylinder or chamber, H, with its valve, k, in combination with the hammer stem, all constructed and arranged for operation together substantially as and for the purpose specified.

4th, The combination of the screws, v, and bolts, x, with the key or wedge, M, and tongue, w, for holding and adjusting the anvil, as herein set forth.

71,824.—SAFETY HOOK FOR WATCH CHAINS.—Antony Wallach (assignor to himself and Adolph Wallach), New York city.

I claim the tongue, i, attached to the shank, b, by the pin, o, so as to turn aside from the hook, c, in combination with the nut, d, as and for the purposes specified.

71,825.—BRAKE FOR SLEDS.—Samuel H. Wallize, Washingtonville, Pa.

I claim the construction and arrangement of the levers, H K and M, with their rollers, L and N, when combined with the drag bar, D, and operating the brake, G, as herein described and for the purposes set forth.

71,826.—PLUMBERS' AND PAINTERS' LAMP.—George Wanier (assignor to himself and Franz Wanier), New York city.

I claim, 1st, The lamp vessel, B, provided with a pipe, D, in combination with a lamp, A, and case, C, all arranged and operating substantially as and for the purpose specified.

2d, The lower stand, C, in which the lamp, A, is placed, in combination with the upper stand, C, and vessel, B, constructed and arranged substantially as and for the purpose specified.

3d, An automatic blow pipe, made to blow alcohol or other steam through the flame of a lamp, the steam being created by the same flame through which it is forced, substantially as herein shown and described.

71,827.—PLOW WHEEL.—J. B. Webster and Robert Baxter, Stockton, Cal.

We claim the board or plates, a, Fig. 1, in combination with the wheel, as and for the purpose hereinbefore described.

71,828.—DOOR HOLDER.—George Wells, Bethel, Conn.

I claim, 1st, The bolt or tail, C, and pad, D, operated in the manner and for the purpose set forth.

2d, The foot lever, A, in combination with the eccentric or cam, B, or an equivalent thereof, to operate the bolt or holder, C, for the purpose substantially as described and shown in the drawings.

71,829.—HORSE HAY FORK.—H. Williard, Grand Rapids, Mich.

I claim an improved horse hay fork, having a worm screw, A, on a spiral shank, a, in combination with a handle, B, arranged and operating substantially as herein described.

71,830.—CONCENTRATING CELESTIAL AND TERRESTIAL GLOBES.—Hugh Williamson, New York city.

I claim, 1st, The terrestrial globe, G, hung within, and having the same axis and center with the celestial globe, C, in manner substantially as above set forth and described.

2d, As a new article of manufacture, a transparent celestial globe, made of two hollow hemispheres, C C', having the constellations upon them, and the line, N, of the ecliptic, and the equinoctial and solstitial colures, L and M, when such hemispheres are adapted to receive terrestrial globe and universal horizon, and with the line of their junction forming the celestial equator, as herein shown and described.

3d, The universal horizon, H, suspended from the forked arms, I, of the axis, D, in manner and for the purposes substantially as set forth and described.

4th, The terrestrial globe, G, and universal horizon, H, in combination with the transparent celestial globe, C, in manner and for the purposes substantially as above set forth and described.

71,831.—CORN CAKE MOLD.—Benjamin Witherell, Charleston, Mass.

I claim the combination and arrangement of the two series of adjustable knives with each other, the flange, G, the platen and its series of followers, provided with springs, as specified, the whole being to operate with the bed, A, and the frame, B, thereof, substantially in manner and for the purpose as hereinbefore explained.

71,832.—HARVESTER.—W. A. Wood, Hoosick Falls, N. Y.

I claim, 1st, Connecting the finger-bar and cutting apparatus of a mowing machine to the main frame thereof by a yielding or spring connection, bolted rigidly at one end to the front outer corner of the main frame, and hinged at the other end directly to the shoe piece, which supports the finger bar and cutting apparatus.

2d, The use, in a mowing-machine, of a shoe piece or runner, which supports the finger beam and cutting apparatus, when said shoe piece is held in place at its rear end by a stirrup or loop passing over an axle, and is held laterally by a yielding spring connection, hinged at its lower end to the shoe, and bolted at its upper end to the front outer corner of the main frame.

71,833.—PORTABLE DERRICK.—Chatham B. Wright, Belmont, Ohio.

I claim the pawl, O, and adjustable tripping-block, E, in combination with the revolving derrick, D C B K, and hoisting rope, J, substantially as herein shown and described, and for the purpose set forth.

71,834.—CULTIVATOR.—Ira Barber, La Porte, Ind.

I claim the beams, B B, the chain, C, and the pivoted flat bar, D, the double curved shovel, F, and the slotted bar, I I, as substantially as arranged, connected, and set forth in the annexed and foregoing specification.

71,835.—HARNESS TRACE.—Thomas S. Judson, Matteawan, New York.

I claim, in combination with a wire interior, the application of cloth and india rubber coatings for forming a trace, when arranged in the manner and for the purposes set forth.

REISSUES.

2,808.—HORSE HOE.—R. B. Dunn, and John C. Flint, Bangor, assignees by mesne assignments of Moses Chandler, East Corinth, Me.

We claim, 1st, The employment of two shares converging towards their rear, and made capable of adjustment to or from each other, either at their front or rear, or both.

2d, So attaching or jointing the forward ends of these shares to their supporting rods, as that they may be turned and adjusted thereon as centers, more or less obliquely relatively to the beam.

3d, The means, substantially as described, for adjusting vertically the rear ends of the shares to vary the depth of their penetration into the earth.

4th, The combination with the shares of pivoted wings, extending rearwards therefrom.

5th, So connecting the wings to the shares as that they will partake of their vertical adjustments, and also admit of being thrown up out of action when not needed.

6th, A wing constructed with a slightly concave curvature on its under side, to round up the earth as the furrow is covered.

7th, Supporting the shares upon bent rods capable of being adjusted laterally in the devices which hold them in position.

8th, Supporting the shares, both at front and rear, upon such rods to admit of either end being adjusted relatively to the other.

9th, So supporting the shares by means of rods and adjusting devices, that they may be lowered or raised, either at their front ends or at their rear ends at option or at both, substantially as shown and described.

10th, Securing adjustably and steadying the share supporting rods to the beam by means of screw-threaded eyes or loops and nuts.

11th, The adjustable and yielding cultivator blades, adapted to be lifted and thrown out of action when desired.

12th, The means, substantially as described, for adjusting the cultivator blades and their supports to or from each other, without unfastening them from the bars to which they are secured.

13th, Forming in one piece the cultivator blade support, and the coiled spring which sustains it, and admits of its various movements, substantially as described.

14th, The provision in the beam of a slot, J, as and for the purpose described.

15th, The adjustable stay rod, as and for the purpose described.

16th, The combination with the stay rods which brace the shares of the slot in the beam, and means for firmly securing the rods in variable positions, substantially as described.

2,809.—Harvesting Machine.—David J. Marvin, Stockton, Cal.

I claim,1st, In a combined header and thrasher, so pivoting or hinging the cutter frame upon the main axle, a, that it can be moved longitudinally, and also raised or lowered at pleasure, substantially as and for the purpose specified.

2d, In a combined header and thrasher, having its cutter frame mounted or hinged as above described, the combination and arrangement of the bar, a', posts, b' b', pulley, d', cord, c', and crank rod, N, substantially as and for the purpose herein set forth.

3d, The arrangement of the sickle plate, b, aprons, 2 and 3, corrugated feed roller, B, thrashing cylinder, F, fan, S, inclines, o p, straw-carrier, D, screen, E, conveyor, F, and elevator, G, substantially as described.

4th, In a combined heading and thrashing machine, as above described, the arrangement of the lever, A, swinging axle, s, and gear wheels, b' Q, for the purpose of throwing the thrashing and cleaning mechanism into or out of gear, substantially in the manner specified.

DESIGNS.

2,844.—Cook's Stove.—Conrad Harris and Paul W. Zoiner, Cincinnati, Ohio.

2,845.—Decorating Croquet-Balls and Mallets.—Chas. Wright Kirby, New York city.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address Munn & Co., 37 *Park Row, N. Y.*

39,102.—Lamp Burners.—Wm. Painter, Baltimore, Md., and Charles Painter, Owing's Mills, Md., assignees of Wm. Painter, aforesaid. Dated June 30, 1863. Application for reissue received and filed Oct. 26, 1867.

We claim having the side pieces, h h, and the ends, g g, constructed and arranged in reverse inclined positions, in the manner herein shown and described.

The combination of the attachment above specified with the tubes, F A, the latter being screwed into the fountain or body, B, of the lamp and enclosing the wick adjusting wheels, b, as set forth.

Enclosing the wick ratchets, b b, within the tube, A, closed at its upper end to prevent the escape of vapor or odor as set forth.

Making the outer case, A, adjustable upon the tube, A, so that the hight of the cap, C, may be regulated as and for the purpose set forth.

45,219.—Fire Engine.—The Gould Machine Company (assignees by mense assignments of John N. Dennisson), Newark, N. J. Dated Feb. 7, 1865. Application for reissue received and filed Nov. 22, 1867.

We claim, 1st, A force pump which may be adapted to throw a larger or smaller quantity of water at each stroke by varying the effective area of its piston surface in any manner substantially as herein set forth.

3d, A force pump provided with one or more parts or passages, the openings of which will relieve a part of the piston surface from labor or pressure on the water, so that the whole power of the steam piston can be applied to the water delivered from the pump by the operative parts of the piston.

3d, Increasing or diminishing the effective area of the pump or pumps, by means of a valve placed in the partition between them, or by other means substantially the same, so that the quantity of water discharged at a stroke can be increased or diminished at pleasure, without altering the speed or stroke.

69,181.—Buckle.—Ezra Cole, Fairfield, Mich. Dated Feb. 24, 1867. Application for reissue received and filed Nov. 23, 1867.

I claim the buckle constructed as described, consisting of the curved frame, A, having at one end the plate, C, provided with a downward projection or lug, D, in combination with the bail, E whose pins, F, rest and slide upon the upper edges of the curved frame, A, as herein described, as and for the purpose specified.

49,799.—Plows.—William S. Spratt, West Manchester, Pa.—Dated Sept. 5, 1865. Application for reissue received and filed Nov. 23, 1867. Div. A.

I claim making a mold board for steel plows, with a bed for the plow share, said mold board and share bed being made in one or more parts, with the land side bolted to the share bed, the whole being constructed and arranged substantially as herein described and for the purpose set forth.

49,799.—Plows.—William S. Spratt, West Manchester, Pa.—Dated Sept. 5, 1865. Application for reissue received and filed Nov. 23, 1867. Div. B.

I claim making a mold board for steel plows with a bed for the plow share, said mold board and share bed being made in one or more parts, with the land side welded to the share bed, the whole being constructed and arranged substantially as herein described and for the purpose set forth.

52,297.—Tobacco Pipe.—Gustav Lauteuschlager, Cincinnati, Ohio, and George L. Gott, New York city. Dated Jan. 30, 1866. Application for reissue received and filed Nov. 25, 1867.

We claim a bowl or a nicotin receptacle of a tobacco pipe, made of coal dust mixed with pitch or other suitable cement, and formed substantially as and for the purposes described.

1,493 (Whole No. 32,497).—Cork Machine.—Isaac Goodspeed, Norwich, Conn., A. A. Goodspeed, Putnam, Conn., and E. S. Stebbins, Worcester, Mass. Dated June 4, 1861. Application for reissue received and filed Nov. 29, 1867.

We claim the following to be the invention of the said Isaac Goodspeed, that is to say,—

We claim the combination composed of one or more cutters, a, tapering guides or frustra, b c (or the equivalent of the latter), the rotary shaft, d, and mechanism for advancing such cutter, or cutters, with respect to said shaft, while it and the cutter, or cutters, may be in revolution, the whole being to cut a conic frustum for a slan of cork, or other material.

We also claim the combination of the same and mechanism for holding the cork slab in place with respect to and while being cut by the cutters, such mechanism being the bunter, b, and its adjuncts, as hereinbefore specified.

We also claim a combination composed not only of one or more cutters, a, a shaft, d, tapering guides, b c, and mechanism for advancing such cutter or cutters, while in revolution with the shaft, but a mechanism for retracting the cutter, or cutters, after a cork or stopper may have been formed by them as specified.

We also claim the combination of the driving pulley, j, the shaft, d, one or more cutters, a, tapering guides, b c, and mechanism for advancing such cutter or cutters, while the same and the shaft, d, may be in revolution.

49,185.—Crank Pin Boxes.—Thomas Welch.—Churchville, N. Y. Dated Aug. 1, 1865. Application for reissue received and filed, Nov. 27, 1867.

1st, I claim in combination with adjustable boxes in harvesters, a pitman so united therewith that it will move freely, or work independently of the boxes without cramping or binding the parts, for the purpose set forth.

2d, In combination with the adjustable boxes and independently acting pitman, a, set screws, s, for the purposes set forth.

49,183.—Harvester.—Thomas Welch, Churchville, N. Y. Dated Aug. 1, 1865. Application for reissue received and filed Nov. 27, 1867.

I claim, 1st, Providing the crank pin box of a harvester with an oil reservoir, for the purpose set forth.

2d, The crank pin box or head of harvester, so constructed with reference to the crank pin as to project by or around the end of the crank pin, for the purpose specified.

3d, In combination with a crank pin box provided with an oil reservoir, a screw cap, G, or its equivalent for the purpose of allowing the reservoir to be filled with and prevent the escape of unnecessary oil therefrom.

4th, A spherical taper pin, or conical shaped joint, for connecting the pitman and knife head of a harvester, when the parts of said joints are held together by means of a bolt passing into or through the knife head, for the purpose set forth.

5th, In combination with a spherical taper pin, or conical shaped joint, secured by a bolt as above specified, a washer made of leather, iron, India rubber, or any other suitable material, and used upon the said bolt for the purpose set forth.

☞ Note.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application to MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y.*

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

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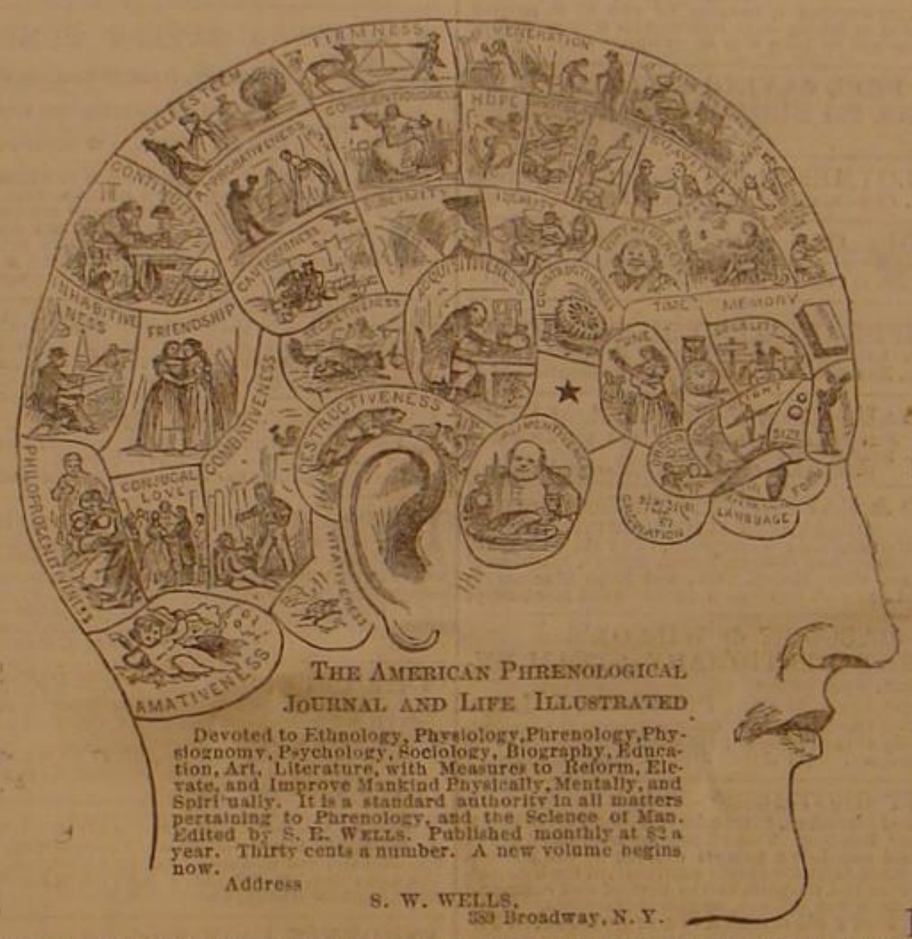

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1868.

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Vol. XVII.—No. 26. [NEW SERIES.]

NEW YORK, DECEMBER 28, 1867.

$3 per Annum [IN ADVANCE.]

Improvement in Hulling and Cleansing Hominy.

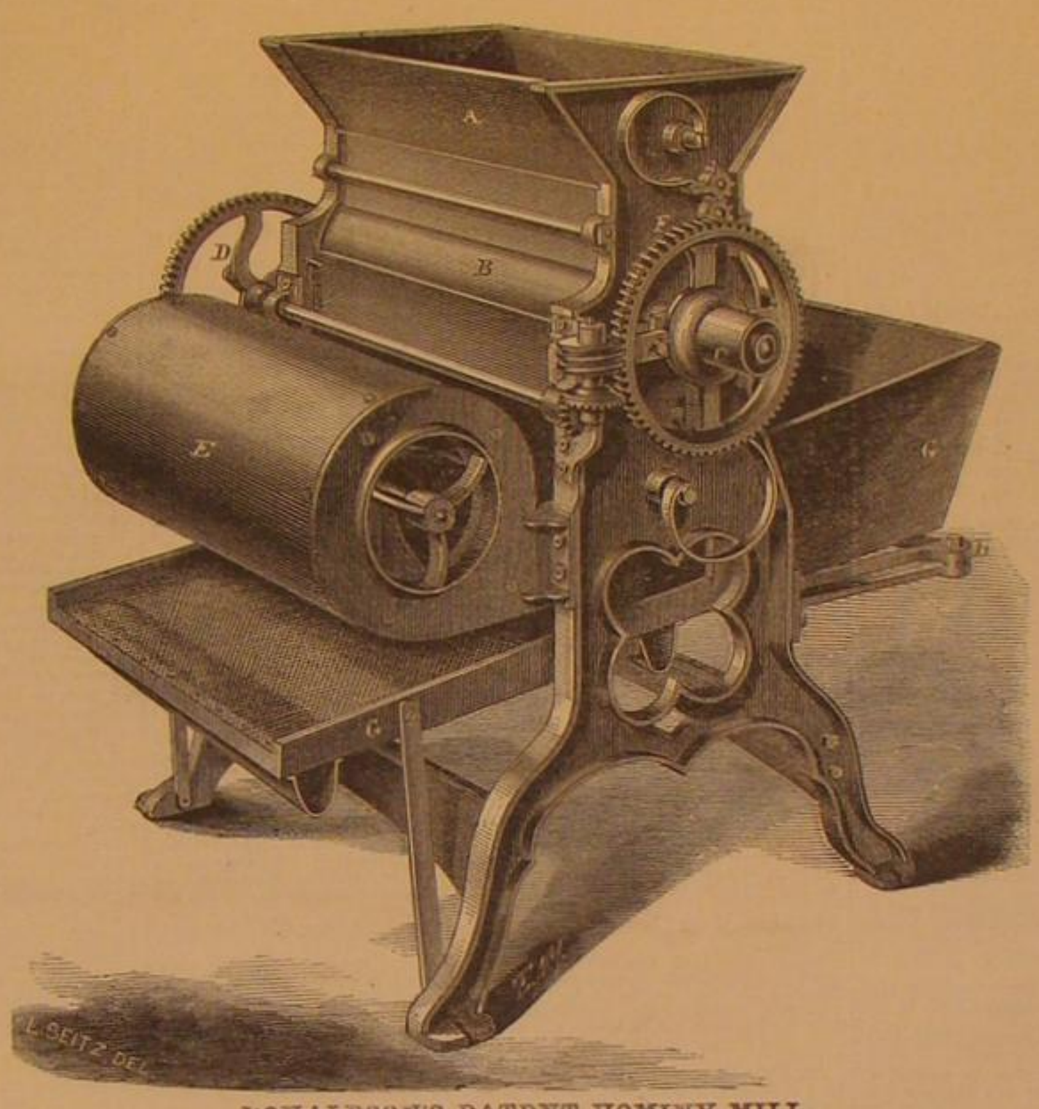
Many of our readers well remember when "hulled corn" was a standing winter dish. This was corn or maize the kernels of which were denuded of their "hulls" by the chemical action of alkalies, which, however, impaired the sweetness of the food. Hominy is corn deprived of the hulls by mechanical means leaving the corn with all its original flavor unimpaired. Hominy is a favorite dish throughout the country, but is not always entirely free from particles of the outer skin of the kernels. The mill shown in perspective in the engraving is intended to obviate this objection.

The corn is placed in the hopper, A, from which it is fed to the hulling cylinder contained in the case, B. The hulling machinery is driven by a belt on the pulley, C, the other end of the shaft of which carries a pinion which gives motion to the gear wheel, D. This, by means of a pinion on the shaft of the blower, E, drives the fans of the blower. On the other, or front end of the shaft which carries the gear, D, is a bevel gear by which another bevel gear and worm is turned. The worm rotates the worm gear, F, in two opposite arms of which are slots that carry pins projecting inwards, which may be moved toward or away from the center. This gear wheel turns free on the shaft that carries the pulley, C, and is intended for opening, by means of the pins in the arms and levers, a cover in the bottom of the hopper and a valve in the bottom of the hulling cylinder. Coiled or bent springs return these levers or valves to place when the pin which moves them has passed.

A wrist-pin on the gear, D, forms a crank which is connected to a bar at the rear end of the sieves, G, pivoted to an arm at H, by which the sieves have a shaking or reciprocating motion as the machine operates. The blower drives out the hulls and the motion of the sieves with their inclined position insure access of the air to every portion of the hominy.

It will be noticed that the connection of all the parts is absolute. The motion of the sieves, the speed of the blower, and the action of the inlet hopper valve and the delivery hulling valve are always exactly proportioned to the speed of the hulling cylinder, whether fast or slow. The upper or feed valve opens upward and has a downward projecting lip that shuts into a recess in its seat which insures security against leakage from the hopper to the hulling cylinder during the intervals of its being raised; a great advantage in hominy making, as no grain ought to get into the batch until that in the cylinder is done.

Patented Oct. 15, 1867, by John Donaldson, who may be addressed for further information at Rockford, Ill.



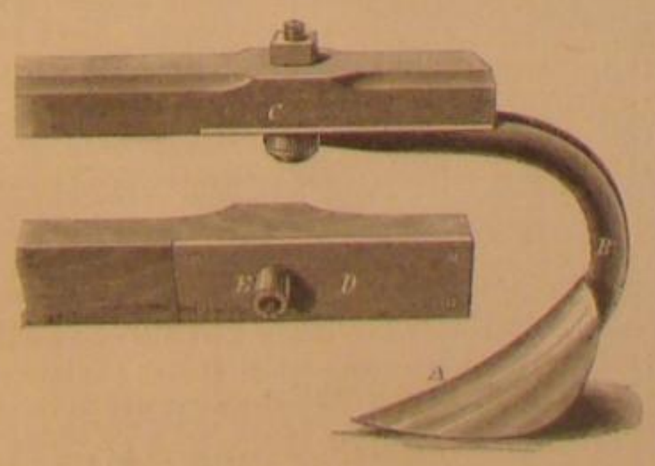
DONALDSON'S PATENT HOMINY MILL.

Nitro-Glycerin.

Professor Doremus of this city was called as a witness at at the inquest upon the bodies of the unfortunate persons killed by the recent explosion at Bergen, N. J. The Professor having previously analyzed some of the explosive mixture, testified as follows:—"I have subjected it to chemical analysis, and find it to correspond to the formula C_6, H_3, O_9, and $N O_5$; it is well made nitro-glycerin; the substance freezes at about 46; it is made to decompose in a very peculiar way; on moistening paper with it it burns with rapidity; it does not explode when red-hot copper is placed in it; we tried it with the most intense heat we can produce with a galvanic battery with two hundred cells holding a gallon and a half each; some nitro-glycerin was placed in a cup and connected with one of the poles of the battery; through a pencil of gas carbon the other poles of the battery were connected with the glycerin, no explosion ensued; but when the point touched the britannia vessel the nitro-glycerin took fire, a portion burning and the rest scattering about; this is as severe a test as we can submit it to in the way of heat under the pressure of the air; we therefore would conclude that nitro glycerin carried about exposed cannot explode, even if you drop a coal of fire into it; if the liquid is confined, or is under pressure, then an explosion will ensue; if paper be moistened with it and put on an anvil and a smart blow given with a hammer, a sharp detonation ensues; if gunpowder or the fulminates of mercury, silver or gun-cotton be ignited in a vacuum by a galvanic battery, none of them will explode; if any gas be introduced so as to produce a gentle pressure during the decomposition, then a rapid evolution of gases will result; the results of decomposition in a vacuum differ from those under atmospheric pressure or when they are burnt in a pistol, musket, a cannon, or in a mine; where we have little or no pressure it is difficult to get these substances to burn rapidly; nitro-glycerin is more difficult to explode than powder; in many respects it resembles gun-cotton which is made in a similar way; if gun-cotton be immersed in the proto-chloride of iron it turns into common cotton; the same experiment was tried with nitro-glycerin by mixing it with proto-chloride of iron, and it reverted into common glycerin; there are four well known varieties of gun-cotton made by employing acids of different strengths they differ in chemical composition and properties, as well as in their explosive qualities; the late Minister of War in Austria in 1862 stated to me that he had ordered four hundred cannon for gun-cotton, and six months after he stated that he had ordered all the cannon to be changed and adapted to powder, in consequence of spontaneous combustions; much less is known of nitro-glycerin than of gun-cotton, and probably several varieties of this article may be formed as of gun cotton; this would explain cases of spontaneous explosion; if the nitro-glycerin is not carefully washed to get rid of the acid, a gradual decomposition will ensue, producing gases, which, if the vessel be closed, will explode; my opinion is that nitro-glycerin should be used in the most careful hands; do not think I would put it in the hands of a common laborer for blasting purposes; it is less dangerous in a frozen than a liquid state; I think concussion would explode frozen nitro-glycerin.

HISERT'S ADJUSTABLE CULTIVATOR TOOTH.

The object of the device exhibited in the engraving is to allow the teeth of a cultivator to turn slightly and avoid obstructions, while they will follow at all times the line of draft, so that in turning the cultivator there is no risk of breaking the teeth or their shanks, or of overturning the implement. The cultivator blade, A, may be of any desired form, and it is secured to the curved shank, B, which is pivoted by a bolt to the beam, C. On the under or lower side of the beam is an iron plate, D, having a projecting socket, E, which is the stud or pin on which the eye of the shank turns. A bolt passing through the socket and beam holds the shank in place. Farmers will readily perceive the advantages of this device. It may be applied to any or all of the different cultivators now in use. Patented Sept. 3, 1867, by B. F Hisert who may be addressed for rights to make or sell at Norton Hill, Green Co., N. Y., or address G. W. King, Scoharie, N. Y.



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"Riding down town these cold mornings in the horse cars, the unpleasant sensation of chilled feet reminds us of the plan adopted in France and other parts of Europe to keep the feet of car passengers warm. This is accomplished by inserting a flattened iron tube along the bottom of the car lengthwise in the center, between the rows of seats. This tube is raised a little above the floor level of the car to afford a rest for the feet, yet, not enough to make a stumbling block. When the car leaves the depot this tube is filled with hot water from a boiler kept heated for the purpose, and this water retains its heat and gives a pleasant warmth to the feet of the passengers and the car generally, for about two hours, after which the tube is refilled at a convenient station on the road. In the case of our city cars this might easily be done, and be a cheap and exceedingly comfortable improvement."—*Evening Post.*

It should be understood that the French cars are arranged with small compartments like stage coaches, and the passengers sit face to face, with the warming tube above described under their feet. One tube for every six persons. We should be glad, indeed, to see this plan introduced here. But it is not to be expected that our city railroad companies will do anything for the comfort of their passengers, while without such trouble they continue to reap rich harvests. Very likely the idea of loading a lot of hot water upon their cars, for passengers to stand upon, would strike them as a good joke. Their poor, broken down, spavined horses, could not stand any additional load.

Getting Your Money Back.

The French are a curious people and one of the novelties of Parisian enterprises is a large warehouse, in which are sold, at retail, all manner of goods, from a diamond necklace to a shoe brush. The purchaser, having paid the price, receives not only the goods, but a bond for the whole amount of his purchase money, payable, after thirty years, and guaranteed by the Credit Foncier and other moneyed corporations. The prices charged are said to be no greater than in any other retail shops. This is really eating your cake in order to keep it; the more you spend the richer you will be; indeed it sets at defiance the whole of Franklin's code of proverbs, and proves "Poor Richard" a silly fellow. Imagine Jones lecturing his wife on her economy, and reproaching her for a spirit of saving, "My dear, if you had bought this camel's hair shawl thirty years ago, it would now be a source of income to us; if you had not been so close we should now be wealthy." Smith acquires an independence by giving his children an expensive education, and sees in every new dress or costly jewel which his growing daughters wear, a new mine of wealth for himself. If he can only persuade them to spend money enough he is sure of a support in his old age.

A GIGANTIC BRIDGE.—A suspension bridge is to be erected by M. Oudry, engineer, over the Straits of Messina, Sicily, from Point Pezzo, on the Calabrian Coast. It is to consist of four spans of 3,281 feet each, elevated about 150 feet above high-water level, so that the largest ships may pass under. The proposed Roebling bridge over the East River, between New York and Brooklyn, is to have a single span of 1,600 feet

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THE first steam vessel used in Great Britain was called the *Comet*, and built by Henry Bell in 1812. It was thirty tuns burden.

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FOR THE WEEK ENDING DECEMBER 10, 1867.

Reported Officially for the Scientific American

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On filing application for Design (fourteen years)	$30

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71,836.—MACHINE FOR NOTCHING KNITTING NEEDLES.—W. Aiken, Franklin, N. H.

I claim 1st, The improved machine, substantially as described, for effecting the several operations of notching, slotting, boring, and burring a knitting-machine needle blank, in the order and manner as explained.

2d, Also, the combination of one or more vibratory clamps, Y, the cam, E, and the two burrs or cutters, q r, for forming the notches in the needle blank such clamp or clamps, cam and cutters being provided with mechanism for operating them, substantially as described.

3d, Also the combination of one or more vibratory clamps, Y, the cam, E, the two burrs or cutter wheels, q r, and the slotting burr or cutters, s, provided with mechanism for operating them substantially as explained.

4th, Also, the combination of one or more rotary clamps, Y, the cam, E, the burrs or cutter wheels, q r s, and the drill, u, provided with mechanism for operating them, substantially as set forth.

5th, Also, the combination of one or more vibrating clamps, the barring cutter, t, the drill, u, and the slotting cutter, s, arranged and provided with mechanism for operating, substantially as explained.

71,837.—TEA AND COFFEE POT.—Alfred Arnold, Tenafly, N. J.

I claim 1st, In a tea or coffee boiler, the base, D, so constructed and adapted, relatively to the other parts, that an oscillating motion will be imparted to the vessel by process of ebullition, substantially as shown and described.

2d, In combination with the base or heating-surface, D, the chambers, b b', and diaphragm, E, or their equivalents, substantially as arranged and described, and for the purposes shown.

71,838.—TOOL FOR SIZING LAMP CHIMNEYS.—Lewis J. Atwood, (assignor to himself and Holmes, Booth and Haydens), Waterbury, Conn.

I claim the adjustable sizing and shaping-jaws employed, substantially as specified, in the manufacture of glass lamp-chimneys and similar articles.

71,839.—MODE OF PREVENTING THE UNTWISTING OF THE ENDS OF WIRE ROPE BANDS.—Artaur Barbarin, New Orleans, La.

I claim a wire rope band, in which the ends of the several wires composing the same are soldered together, substantially as herein described and shown in the accompanying drawings, and for the purposes set forth.

71,840.—SPRING-BED BOTTOM.—Alonzo B. Baty, Binghamton, N. Y.

I claim the construction and application of the bracket, B, in combination with the bail or pendant, C, the springs, D D, transverse pieces, F F, and slats, A A, all being constructed substantially as herein described and represented, for the purpose set forth.

71,841.—HORSE-RAKE.—H. L. Beach, Montrose, Pa., assignor to Beach Wheel Horse-Rake Manufacturing Company, N. Y.

I claim 1st, The teeth heads, N, constructed and operating substantially as described.

2d, In combination with the teeth heads, N, the teeth, Q, substantially as described.

3d, The arms, K, and teeth heads, N, combined and operating substantially as set forth.

4th, The cleaners, M, teeth heads, N, and teeth, Q, when combined for the purposes indicated.

5th, The blocks, i, pins, c, sliding bar, E, and lever, G, when combined for the purposes set forth.

6th, The hooks, l l, and pins, j, secured in the axle for the purpose shown.

7th, The washers, P, combined with the teeth and teeth heads, substantially as and for the purpose described.

71,842.—APPARATUS FOR LIGHTING STREET GAS-LAMPS.—J. W. Beard, St. Johns, New Brunswick.

I claim the combination of the hook, F, and the perforated cap, E, with the lamp, D', to be affixed on a pole or staff, as set forth.

Also, the combination of the curved or hooked arms, c c, with the key, k, of the cock of the burner, and their arrangement with respect to the opening in the bottom of the lantern, as explained.

Also, the combination of the socket tube, e, with the lamp, D', its hook, F, and perforated cap, E.

Also the combination of the receiving tube, f, and bayonet connection, g, with the socket tube, e, the lamp, D', its hook and perforated cap, as described.

71,843.—CALIPER AND T-SQUARE.—Joseph Bennor, Philadelphia, Pa.

I claim the rule, a, stand, c, slide, m, legs, p and q, marker, u, cutter, w, with their several described appendages, all combined in the manner and for the purpose substantially as shown and described.

71,844.—REFRIGERATOR.—Ferdinand Borchard, Detroit, Mich.

I claim 1st, A refrigerator which is provided with movable racks, H, within cooling chambers which are arranged beneath an ice chamber, B, constructed with inclined walls, a a a, a drip pan, D, and an ice-supporting rack, c, substantially as and for the purposes described.

2d, Providing the movable racks, with sliding brackets, I, which are so applied as to serve as supports for the outer ends of the racks when drawn partially out of their respective apartments, substantially as described.

71,845.—CONSTRUCTION OF METAL SALVERS.—George Brabrook, (assignor to Reed and Barton), Taunton, Mass.

I claim the arrangement and combination of the metallic ring and cap molding together, and with the waiter or salver, in manner substantially as and for the purpose specified.

Also, as a new or improved manufacture, a waiter or salver of britannia metal, having a metallic strengthening ring and cap molding combined and arranged with its body in manner as specified.

71,846.—MANUFACTURE OF SHOES, ETC.—M. L. Brett, Warren, Ohio.

I claim the construction of a seamless shoe, etc., by felting, in the manner set forth, as a new article of manufacture.

71,847.—CONSTRUCTION OF SCOOPS.—Theo. C. Bromley, Fort Howard, Wis.

I claim the cone-shaped back and the circular raised brace.

71,848.—WATER-RESERVOIR FOR EXTENSION-TOP STOVE.—Chas. H. Buck, St. Louis, Mo.

I claim 1st, the boiler, D, constructed with a depression in its rear side, in combination with a stove made with the extended top, A, and with, a stove-pipe, C, which is entirely independent of the boiler, but still is partly enclosed by the boiler, in the manner and for the purpose described.

2d, The boiler, D, with its depression in its rear side made wholly independent of the pipe, C, but capable of enclosing a portion of said pipe, and of being removed without disturbing the pipe, as herein described and shown.

71,849.—JOURNAL-BOX.—T. F. Burgess, Lowell, Mass.

I claim the drips, e e, and conducting holes, d d, in combination with the recesses, b b, when arranged to operate substantially as described and for the purposes fully set forth.

71,850.—HAY ELEVATOR.—E. H. Carpenter, Dexter, Mich.

I claim 1st, In combination with a cable, A, frame, F, wheels, G, sheave, E, and rope, C, the disengaging device, consisting of a collar, M, stop, L, and vertical catch, K, inclosing the cable, A, and rope, C, and operated substantially as described

2d, The combination of the frame, F, rope, C, collar, M, stop, L, catch, K, and valves, H, cams, I, and lever, I', said parts being constructed and the whole arranged substantially as set forth.

71,851.—STEAM GENERATOR.—C. E. Case, Xenia, Ohio.

I claim the metal cup, G, constructed and arranged substantially upon the principle and in the manner herein set forth.

71,852.—LOOM FOR WEAVING PALM-LEAF, ETC.—Geo. W. Chandler, (assignor to himself and Lysander F. Thompson), Fitchburg, Mass.

I claim 1st, The hinged holder, G, substantially as and for the purposes set forth.

2d, The combination of the hinged fingers, c c, with the ribs, b b b, substantially as and for the purposes set forth.

3d, The combination of the adjustable weight, G', with the bottom of the holder, for the purposes set forth.

4th, The combination with the hinged fingers, c c, of the hinged holding-piece, G'', substantially as and for the purposes set forth.

5th, The fingered stop or guard piece, h', with the holder, G, substantially as and for the purposes set forth.

6th, The combination, with the stand or plate, h, of the grooved hinged flap, i, for supporting the guard or stop-piece, h'.

7th, The combination with the ribbed holder, G, of the guide piece, s, as and for the purposes set forth.

The combination of the feed arm, m, with the slide-piece, n, and lever, 26, substantially as and for the purpose set forth.

9th, The combination with lever, 26, of the adjustable ears, 27 27 for the purposes stated.

10, The combination with slide-piece, n, and table, L, of the connecting piece, 21, substantially as and for the purposes set forth.

11th, The combination with the slotted slide piece, M'', and connecting piece, 21, of the double-shouldered bolts, 18 18, substantially as and for the purposes set forth.

12th, The combination with the curved lever, M, and the slide piece, M'', of the bent levers, M' M', substantially as and for the purposes set forth.

13th, The combination with the arm, 79, and notched bar, w, of the spring-pawl, t, substantially as and for the purposes set forth.

14th, Mechanism for separating the pieces of material to be fed, constructed and combined for operation substantially as described, and as shown in fig. 7, of the accompanying drawings.

15th, The combination with a loom for weaving palm-leaf and other cloth, of a push-finger, 41, substantially as and for the purposes set forth.

16th, The combination with the stem of the push finger, 41, of the catch-piece, 42, lever, 44, and operating springs, 43 and 46, substantially as and for the purposes set forth.

17th, The combination with the slide, n, of the projection or dog, 47, for releasing lever, 46, from the catch-piece, 42, as set forth.

18th, The combination with the hinged table, L, of the mechanism for separating and feeding the material, substantially as set forth.

19th, The combination with the stationary bed, L'', and stand, 72, of the hinged table, L, and catch, o, substantially as set forth.

20th, The combination and relative arrangement with the table, L, bed, L'', and holder, G, of the evener knives, 13 and 14, as shown and set forth.

21st, The combination with the bridge-piece, 50, of the hinged dog, 52, and bell-spring, 53, substantially as and for the purposes set forth.

22d, The combination and relative arrangement of mechanism, substantially such as is shown and described for communicating the proper motions to the feed arms, S, from lever, K.

23d, The combination with a loom for weaving palm-leaf of mechanism substantially such as shown and described for stopping the loom, as set forth.

71,853.—PITMAN COUPLING.—G. W. Clark, Manchester, Ind.

I claim the arrangement of forked pitman, A G G', bolt, H, screw shanked hook, D, and nuts, F F', or their equivalents, substantially as and for the purpose set forth.

71,854.—MACHINE FOR MAKING LEVEES.—Ernest Comeaux, Bayou Goula, La.

I claim 1st, The endless apron in combination with the hinged adjustable frame, K, operating as described for elevating the earth used in making levees, in the manner and for the purpose set forth.

2d, The combination of the endless apron, F, chains, H, slats, J, and adjustable supporting-frame, K, and standards, L, as herein described for the purpose set forth.

3d, The above in combination with the spur-wheels, C and B, and the endless chain, D, as herein described for the purpose set forth.

72,855.—CONSTRUCTION OF ROOF.—M. De K. Cutts, Richmond, Va.

I claim 1st, A tobacco drying house which is provided with a sectional hinged roof in combination with frames, A, which support the tobacco leaves while being dried and cured, substantially as described.

2d, The supporting posts, G, in combination with hinged sections, B B', elevating devices, and supporting frames, constructed and arranged in such manner that the leaves of tobacco upon said frames can be exposed to the action of the sun and air at pleasure substantially as described.

71,856.—CAR BRAKE.—Shadrach Davis, Dartmouth, Mass.

I claim a car brake, consisting of the broad connecting bar, C1, which rests on pivots, F1, working in slots, and has the brake-shoes movable fixed to it, the whole combined as described, operated by the bar, 12, and screw rod, H2, and by contact with the wheels as and for the purposes set forth.

71,857.—FEEDER FOR GRAIN MILL.—Michael Decamp, South Bend, Ind.

I claim 1st, The combination of the device, D, bridge ring-bearing, a b, feeder, c, and collar, e, substantially as described,

2d, The toothed eccentric, J, in combination with lever, G, and collar, e, substantially as described.

71,858.—PAINTER'S EASEL.—Paul Deschause, New York city.

I claim 1st, The extensible legs, consisting of the hinged legs, a, and their extension sliding parts, b, made and arranged substantially as described.

2d, Also the combination of the legs with the toggle-brace, c c, substantially as described.

3d, Also, the extensible rest, composed of the fixed part, e, and the sliding part, o, in combination with the fixed and movable clamps, f g, substantially as described.

71,859.—GUIDE FOR SAW IN SAW MILLS.—Hiram P. Dillingham, Norwalk, Ohio.

I claim the plates, A and A', guides, B B', and C and C', the whole constructed substantially as described, and operating as and for the purposes set forth.

71,860.—PRODUCING CALCIUM MAGNESIUM LIGHT.—Chas. A. Dresser, New York city. George A. Dresser, Trustee;

I claim the preparation of dolomite, native or artificial substantially as and for the purpose described.

71,861.—CALENDAR ATTACHMENT TO INKSTAND.—Sam'l. R. Dummer, New York city.

I claim 1st, An inkstand, etc., constructed with a series of shoulders or rests, B, whether one or more and one above another, in combination with the rings, C, and plate or frame, D, or their respective equivalents substantially as and for the purpose described.

2d, In combination with the above, the two tubes, H M, and plunger, O, as herein set forth for the purpose specified.

71,862.—PLANING MACHINE FOR WOOD.—G. B. Durkee and W. H. Murray, (assignor to themselves and I. T. Safford), Chicago, Ill

We claim 1st, The employment of two separately adjustable cutter heads in a single machine, so that the axis of one cutter may be at the angle of the other at a different angle, and both cutters operating at the same time upon the same board, substantially as specified.

2d, The crossheads, C, cutter-heads, E, screws, D and G, in combination with the standards, B, constructed and operating substantially as specified.

71,863.—SELF-ADJUSTING RELAY MAGNET.—J. M. Fairchild, (assignor to himself, J. K. Bundy, and J. M. Townsend), New Haven, Ct.

I claim the arrangement of the head, C, combined with the magnet, so as to be self-adjusting in relation to the armature, substantially as herein set forth.

71,864.—CORN CAKE CUTTER.—Leonard Felker, Tewksbury, Mass.

I claim the rotating cylinder, i, with its cutters, i' i', in combination with the rotating cylinder, ', with the stationary knives f' f', and adjustable finishers, g g, when arranged to operate substantially as described and set

2d, The pressure rotating cylinder, f, with stationary knives, i' i', and adjustable finishers, g g, substantially as described and set forth.

3d, The clearer, m, in combination with the rotating cutters, i' i', as described.

4th, The adjustable stands, d d, and lever, p, in combination with the table, b', and weight, o, when arranged to operate substantially as described.

71,865.—MEASURING FAUCET.—Elisha Fitzgerald, N. Y. city.

I claim the combination of a four way cock with a receptacle having a movable partition operated by the water, substantially as described, for the purpose of limiting and determining the amount of water to be discharged, as specified.

Also, in combination with the above, the dial and pointer, to indicate the amount of water discharged, as described.

71,866.—TWEER.—Charles C. Forncrook, Hermitage, N. Y.

I claim the combination of the valve, d, adjustable bridge, g, chamber, B, and tweer, A, arranged and operating substantially in the manner and for the purpose set forth.

71,867.—COTTON TIE.—John H. Fraley, New Orleans, La.

I claim the combination of the buckles, A and B, when they are constructed and united as described, with the ends of hoop iron, when bent into the form of hooks, as and for the purpose set forth.

71,868.—BRIDGE.—John Glass, George P. Schneider, and William B. Rezner, Cleveland, Ohio.

We claim, 1st, The tubular flanged sections, A B, as arranged in combination with the diaphragm, C, for the purpose and in the manner substantially as set forth.

2d, The tubular arch, as constructed, with sections, A B C, in combination with the foot block, I, provided with a flange or boss, K, when arranged in the manner as and for the purpose set forth.

71,869.—OIL CUP.—John H. Gomer, New York city.

I claim the combination of the cap, B, with its screw flange, b, and case, A, provided with suitable tube, C, in the manner and for the purpose herein specified.

71,870.—PEAT MACHINE.—George D. Goodrich, Chicago, Ill.

I claim, 1st, The adjustable bearing for the shaft, B, composed of two or more segments, r, constructed and operating substantially as described.

2d, The separate troughs, I, located below the tempering mill, when more than one expelling screw is employed, so as to give each screw a separate and independent action, substantially as specified.

3d, The cutter or knife, F, for cutting the material into suitable lengths in a peat machine having a continuous discharge from the expelling mill, substantially as specified.

4th, Closing the mouth of the die by an adjustable intermittent stop or knife, when so arranged that the movements can be varied with respect to the movements of the other operating parts of the machine, substantially as specified.

5th, The double slotted plate or wheel, K, provided with the sockets, h, and pins, l, for the purpose of adjusting the movements of the cutter stop or knife, F, substantially as described.

6th, The combination of the separate troughs, I, expelling screws, H, and cutter stop, F, with a tempering mill, substantially as specified.

71,871.—RATCHET BED KEY.—William M. Gray, Brooklyn, N. Y.

I claim the bed key constructed and arranged as above described, as a new article of manufacture.

71,872.—MODE OF PREVENTING THE EXPLOSION OF LAMPS.—Cyrus P. Grosvenor, McGrawville, N. Y.

I claim the application to lamps or heaters, using coal oils, alcohol, or other explosive substances, of such a burner as will supply the vacuum made in the reservoir by the combustion with nitrogen gas, the burner being constructed as herein described, or in any other form substantially the same, and which will produce the intended effect.

71,873.—CAR-AXLE BOX.—Joseph Harris, Dorchester, Mass.

I claim, 1st, The roller guides, i, with detached radial joints, substantially as described.

2d, In combination with the system of rollers and box, g, the construction of the axle, with its extension, e, and shoulder, d, as and for the purpose set forth.

71,874.—WASHING MACHINE.—Job H. Haskell (assignor to himself and Horace Taplin), Lowell, Mass.

I claim the general construction and combination of all the parts, consisting of the cylinder, G, series of yielding rollers, a, roller stands, k, spring bars, f, levers or arms, m, spring bar, D, transverse bar, R, rod, O, and the box, the whole arranged to operate substantially as and for the purpose set forth.

71,875.—HORSE RAKE.—John V. Hawkey (assignor to himself and Israel T. Sheffler), Greensburg, Pa.

I claim, 1st, A rake shaft or head, arranged outside of the periphery of the wheels, projecting laterally beyond them, and so jointed that its sections can be folded vertically upon the carrying frame without detaching any of the parts of the rake, substantially as described.

2d, An axially turning rake-shaft, so jointed that its outer sections can be folded inwards without detaching any of its parts.

3d, The combination of the inner fixed section of the rake shaft with the outer vertically folding sections, projecting beyond the wheels, substantially as and for the purpose described.

4th, The combination, substantially as described, with a jointed rake shaft, of hinges allowing the sections to fold vertically, and a locking device to hold them rigidly when unfolded.

5th, The arrangement as described, of the top pins, m, on the folding sections, to secure them in position when folded up.

6th, The combination in a horse rake, of an axially turning folding rake shaft, with a rock shaft controlled by a handle on the driver's platform to raise and lower the teeth.

7th, The arrangement, in a horse rake, of an axially turning jointed rake shaft, mounted on the rear end of the thills, and supported on two wheels mounted on independent axles.

71,876.—APPARATUS FOR DRAINING SUGAR.—James B. Hill, Allegheny City, Pa.

I claim the combination and arrangement of the hopper, C, provided with valve, d, case, B, screen, R, distributing drum, P, distributor, f, provided with valve, l, scraper, S, chute, h, and pipe, t, the whole being constructed, arranged, and operating substantially in the manner herein described, and for the purpose set forth.

71,877.—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—James B. Hill, Allegheny City, Pa.

I claim the use of a fan when used in combination with the shield, m, distributor, f, screen, R, case, B, hopper, C, and scraper, S, constructed, arranged, and operating, substantially in the manner herein described, and for the purpose set forth.

71,878.—CARD HOLDER.—Samuel L. Hill, Brooklyn, N. Y.

I claim, in combination with a back or support, the use or employment of any number of strips when the same shall be constructed and combined substantially as shown for the purpose specified.

71,879.—FISHING LINE SWIVEL.—Martin Hiltz, Gloucester, Mass.

I claim the improved swivel, as made with the screw bolt, D, and the nut chamber, c, arranged and combined, as explained, with the parts, A B C, constructed and applied together as specified.

61,880.—IMPLEMENT FOR LIGHTING GAS.—Thomas W. Houchin, Morrisania, N. Y.

I claim, 1st, Placing a receiver, A, at the lower end of a tube, B, for the purposes fully described.

2d, The combination of a receiver, A, tubes, B, and wick chamber, C, when the same shall be constructed substantially as described, for the purposes set forth.

71,881.—CORN-POPPER.—J. W. Howe, and J. K. Barton, Worcester, Mass.

We claim, 1st, The combination of the twisted wires, a a a' a', with the handle, B, and receptacle, A, substantially as and for the purposes described.

2d, The combination of the wires, a' a', with handle, B, receptacle, A, and cover of the same, as and for the purposes described.

3d, The combination of the wires, a a a' a', with each other, receptacle, A, and cover of same, as shown and described.

71,882.—COPY BOOK.—Benj. G. Howes, Worcester, Mass.

I claim the copy book, constructed substantially as described.

71,883.—PETROLEUM GAS BURNER.—G. A. Hyver, New Orleans, La.

I claim, 1st, The combination of the pipe, D, when filled with finely broken charcoal, with the concentric or annular chamber, F, the latter being provided with pipes, b, extending upwardly into the cup furnace or heat retort, H, as and for the purpose substantially as set forth.

2d, The combination of the pipe, D, when filled with finely broken charcoal, the concentric or annular chamber, F, pipes, b, and pipe, d, with the gas pipe, c, when the latter is provided with the valve, J, for regulating the flow of gas, as and for the purpose described.

3d, The gas pipe, c, when constructed and arranged with relation to the chamber, F, and one of the pipes, b, as described, in combination with the valve, J, for the purpose set forth.

4th, The combination of the concentric or annular chamber, F, and pipes, b, with the cup furnace or heat retort, H, when the latter is constructed as described, and shown upon the drawings, and occupies the relation to the former herein set forth, for the purpose set forth.

5th, The pipe, d, in combination with one of the pipes, b, for the purpose of affording a light for illuminating purposes, as herein described.

71,884.—SHAFT COUPLING.—John Keesey, Chester, Pa.

I claim the combination of the box, hub, or shell, B, reverse wedge-shaped blocks, C C', and bolts, D D', with their nuts, E E', or the equivalents of these devices, arranged for operation together, substantially as and for the purposes herein set forth.

71,885.—CLAMP SCREW.—Charles L. Kingsley (assignor to Charles Parker), Meriden, Conn.

I claim the nut, E, formed with the seats, F, and the lever, G, formed with the trunnions, I, so as to be combined and operate in the manner and for the purpose described.

71,886.—MACHINE FOR BENDING WOOD.—Joseph Klahr, Bernville, assignor to himself, W. R. Weand, C. H. Zink, and James J. Wagenhorst, Philadelphia, Pa.

I claim, 1st, The formers, F F', with their arms, p p', levers, k k', and catches, q, or their equivalents, in combination with the clamps, G, the whole being constructed and operating substantially as and for the purpose described.

2d, The combination of the above, the weighted levers, D D', and the links, l.

3d, The adjustable plates B B', with their shoulders, c, operating in combination with the formers, and their projections, q, substantially as and for the purpose described.

71,887.—OIL CAN.—George Alvan Knowlton, Natick, Mass.

I claim, 1st, The stoppers, D and I, retracted from their respective orifices by a single trigger, H h', and provided with two springs, G J, to insure the effective closure of both said orifices, substantially as described.

2d, In a valved oil can, constructed as above specified, the arrangement of the trigger, H h', obliquely on the upper side of the handle, A', as and for the purpose set forth.

71,888.—FENCE.—Ira Lackey, Lebanon, Ohio.

I claim the combination of the sills, A, braces, C, and hooks or loops, l l, with the grooved posts, a c, of the panels, when the parts are constructed and arranged to form a detachable and portable fence, in the manner and for the purpose specified.

71,889.—BUTTER DISH.—Nathan Lawrence (assignor to Reed and Barton), Taunton, Mass.

I claim the arrangement and combination of the friction spring with the cover and vase, the journal and the bearing to extend entirely around the said journal, as specified.

71,890.—HARVESTER RAKE.—Edward J. Leyburn, Lexington, Va.

I claim, 1st, Connecting the rake arm, E', to a loose collar, c, on reel shaft, B, by means of a pivot, d', carrying an arm, f, in combination with the jointed connecting rod, h, substantially as described.

2d, The arresting plate, G2, in combination with the rake pivot, d', arm, f, and collar, c, and connecting rod, h, substantially as described.

3d, The cam plate, G G1, in combination with the rake pivot, d', loose collar, c, and connecting rod, h, substantially as described.

4th, The anti-friction roller, i, applied to the arm, f, of the rake pivot, in combination with the arresting plate, G2, substantially as described.

5th, Connecting the arm, f, which is in the rake pivot, d, to the reel shaft or reel arm thereof, by means of a rod, h, and universal joint, h', substantially as described.

6th, The application of a weight, g, to an arm, f, of the rake pivot, when said arm is upon a loose collar, c, and arranged to operate substantially as described.

71,891.—WASHING MACHINE.—Reuben Lighthall, Brooklyn, N. Y.

I claim the detachable holder, A, with the set screw, B, in combination with the slotted lever, D, and the rollers, F F', and the cam, R, as and for the purpose set forth.

71,892.—PROCESS FOR RENDERING PAPER, CLOTH, AND THE LIKE, FIRE AND WATER PROOF.—Robert O. Lowrey, Salem, N. Y.

I claim the process, substantially as herein described, of treating fibrous and other materials for rendering them fire and water proof.

71,893.—COMPOSITION OF MATTER FOR THE MANUFACTURE OF WATER PROOF PAPER AND OTHER ARTICLES.—Robert O. Lowrey, Salem, N. Y.

I claim, 1st, The new compound or composition of matter, produced by the treatment of vegetable fiber, substantially as described.

2d, The process herein described of treating vegetable fiber for producing a new compound, substantially as set forth.

71,894.—STREET SWEEPER.—Robert Y. McConnell and Geo. Pringle, Rochester, N. Y.

We claim, 1st, The pinions, a, of the counter shaft, s, combined with carrier wheels, W, of street sweepers, by suitable sliding clutches, c, all arranged substantially as shown and described, and for the purpose of equalizing the strength and efficiency of those portions of the machine.

2d, The broom shaft, b, and the counter shaft, s arranged substantially as shown, being held by means of the adjustable rigid straps, y, for the purposes set forth.

3d, The spring clutches, c, governed by means of the hand lever, D, connecting rod, f, lever, k, and the counter inclined planes, m, all arranged and operating substantially in the manner and for the purposes set forth.

71,895.—UTERINE SUPPORTER.—Frederick Meriwether, Tamola, Miss.

I claim the combination, as described, of the spring, E, composed of copper or other soft metal, with the pessary, for the purposes set forth.

Also, the combination, substantially as described, of the pelvic spring, the vertically adjustable bar and set screw, the soft metal spring, E, the pessary pillar, F, and the pessary, for the purposes specified.

71,896.—RAILROAD SIGNAL.—Abraham S. Miller (assignor to himself, J. P. James, and Charles Folsom), Zanesfield, Ohio.

I claim, 1st, The combination of the trigger, E, and rock shaft, F f, with a railroad signal and suitable intermediate connections, so arranged that the contact of the train with said trigger shall throw the signal into its conspicuous position, substantially as described.

2d, The arrangement of the trigger, E, rock shaft, F f, arm, H, link, I, lever, G, wire, J, eccentric lever, L, catch, M, and shaft, B, signal, A, and weight, B', or its equivalent (P P1 P2 Q), substantially as and for the purpose specified.

3d, The arrangement of the trigger, E', rock shaft, F' f', arm, H', and rod or other suitable connection, N, all arranged and operating substantially as and for the purpose set forth.

4th, The combination, with the disk or signal, A, of the reflecting plate, a substantially as and for the object stated.

71,897.—SPINNING WHEEL.—Henry Miller, Ronald Township, Mich.

I claim the arrangement of the adjustable and hinged rods and levers, constructed as herein described, for connecting the rocking treadle with the

hinged spindle arm, so that the operator, by the foot, may move the spindle arm out or in at pleasure, as set forth and represented.

71,898.—BOOTS AND SHOES.—Charles Mole, Pembroke Terrace, Regent's Park, London, England.

I claim the manufacture of a movable boot heel in two parts, to be adjusted in different positions by means of a single central projection taking into a single slot hole or countersunk part, and secured in position by means of a central screw or pin, whether such projection and hole or countersunk part be square or many-sided, and no matter what the shape of these sides, so that the shape of the projection and that of the hole which is to receive it be identical, the whole substantially as hereinbefore described and illustrated on the annexed sheet of drawing.

71,899.—WATER COOLER AND REFRIGERATOR.—Alfred Murden and Henry L. Cooper (assignors to themselves and Francis Warner), New Haven, Conn.

We claim the arrangement of the cylinder, A, and outer cylinder, C, so as to form a water space, D, and combined with covers, E and G, so as to form a chamber, F, above the water space, D, and ice cylinder, A, so that the cover, E, forms the bottom of and the cover, G, the top of the said chamber, in the manner and for the purpose herein set forth.

71,900.—CONSTRUCTION OF STAMPED SHEET METAL KETTLES.—Frederic G. Niedringhaus and William F. Niedringhaus, St. Louis, Mo.

We claim the spout of a kettle when formed by pressure from the bottom and top plate of the kettle, when constructed substantially as shown and specified.

71,901.—BREAST STRAP SLIDE.—O. B. North (assignor to O. B. North & Co.), New Haven, Conn.

I claim, 1st, The arrangement of the hinged tongue, E, upon the plate, A, so as to cover the ring, substantially in the manner herein set forth.

2d, Constructing the hook or projection, D, upon the inside of the plate, by forming an opening, C, through the plate, substantially as and for the purpose herein set forth.

71,902.—SNOW PLOW.—Abel Nutting, Quincy, Mass.

I claim the rotary plow, arranged to operate substantially as set forth.

Also, in combination with such a plow, inclines, or shares, fixed, with respect to the frame by which they are supported, substantially as described.

71,903.—STEAM GENERATOR.—Isaac R. Oakford, Philadelphia, Pa.

I claim a steam generator, composed of a series of cylindrical boilers, of round ends, provided with openings for steam and water, and arranged in a vertical and inclined position, in the manner and for the purpose above set forth and described.

71,904.—CASTER FOR FURNITURE.—P. B. O'Brien and Wm. E. Sparks, New Haven, Conn., assignors to P. B. O'Brien.

We claim the arrangement of the spring, a, in the spindle, B, and combined with the socket, C, so as to operate in the manner substantially as described.

71,905.—RAILWAY FROG.—Staats N. Park, Bloomsbury, N. J.

I claim, 1st, So constructing the frogs of railways that the frog plate and the rail or track sections, guard rails, and frog point are separate from each other, and so that the rail sections and guard rails and frog point can be inserted in or attached to and detached from the frog plate, for the uses and purposes set forth.

2d, So constructing the frogs of railways or the frog plate, that the track rails of any railway can be extended upon and combined with such frog plate to form the track or rail section of the frog, substantially as and for the purposes set forth.

71,906.—HARVESTER.—Henry W. Pell, Rome, N. Y.

I claim, 1st, The carriage, C, supported at both ends on wheels or rollers, c c, running on a guide way, S, substantially as and for the purposes specified.

2d, The rib or groove joint between the friction rollers and guide-way, to sustain the lateral pressure, as set forth.

3d, The clevis pin or whiffletree bolt, B, attached to the center of the carriage, C.

4th, The independent attachment of the draught clevis to the whiffletree bolt to permit the independent oscillation of the whiffletree without affecting the clevis.

71,907.—MEDICAL COMPOUND.—M. Perl, New Orleans, La.

I claim the medical compound herein described, when made by the process and composed of the ingredients herein specified, in the proportions stated, for the purpose set forth.

71,908.—MACHINERY FOR SHAVING AND SLOTTING SCREWS.—Elijah S. Pierce, Hartford, Conn.

I claim, 1st, The combination of the cam, M, the sliding frame, Y, the spindle, A, the pulley, P, the clamp, C, the spring, S, and the rest, R, or their equivalents, with a shaving tool, and one or more nicking saws, substantially as herein specified.

2d, The combination of the sliding frame, Y, the spindle, A, and the clamping device, C, with a shaving tool and one or more saws, substantially as described, for the purpose of shaving, nicking, and turning screw blanks or other similar articles, while held in the same jaws.

71,909.—DOUBLE SCREW.—Elijah S. Pierce, Hartford, Ct.

I claim the double screw herein described and shown, as a new article of manufacture.

71,910.—APPARATUS FOR PRESERVING MEATS, FISH, POULTRY, AND OTHER PERISHABLE ARTICLES.—Charles F. Pike, Providence, R. I.

I claim, 1st, Constructing a tubular ice box, with holes or openings in the tubes or pipes, at or near the bottom, to let the air out into the chamber, F, and slots or openings into the ice receptacle, reservoir, or depository, near the top, and so get the combined and double purpose of radiation, conduction, and internal circulation of the air in the chamber, F, substantially as and for the purposes set forth and described in the drawing and specification hereunto annexed, without confining myself to any particular form, size, or shape of the pipes or tubes, whether they be vertical or horizontal, round, square, oval, oblong, or in any other form, neither do I confine myself to any particular form of ice receptacle, reservoir, or depository.

2d, The perforating or making slots, holes, or openings in the tubes or pipes, near the bottom, for the purposes set forth and described, howsoever the same may be made, whether used in connection with the ice receptacle, reservoir, or depository, as described, or without the openings in the ice receptacle, reservoir, or depository, for the purpose of the rotating of the air.

3d, The ice receptacle, reservoir or depository, with its openings to let the air into and on to the ice in this ice receptacle, reservoir, or depository, for the purpose of taking off the moisture in the preserving room, at or near its top, whether the tubes connected to the bottom of this ice receptacle, reservoir, or depository, are perforated or not, or whether the ice receptacle reservoir, or depository, is removed altogether, and the tops or collars of the tubes or pipes are perforated.

4th, The ice box, receptacle, reservoir, or depository, A, as described, pipes or tubes, B C D L, pan, E H, room, F, substantially as described and set forth, with their appendages.

71,911.—MULTIPLYING REFLECTORS FOR PHOTOGRAPHIC CAMERA.—D. W. S. Rawson, Peru, Ill.

I claim, 1st, The reflector box, A, the doors and shade wings, B B, the bars, C C, the non-reflecting division, D D, surrounding and between the several mirrors, the base board, F, and the slide board, G, and the double pivot, H, when used for the purposes herein described.

2d, The use of the lever for the purpose of adjusting the reflectors.

3d, The moving of the reflectors with the slide, G, to produce more than one set of impressions on the same plate, or an equivalent movement.

71,912.—CAR SPRING.—Wm. F. Ray, Fort Wayne, Ind.

I claim a series of reflexed springs, so constructed that the bows slide into each other, the whole being adjustable so as to regulate the amount of elasticity, as described.

71,913.—LAMP BURNER.—Henry Read, Providence, R. I.

I claim the skeleton bottom, B, in combination with the perforated cylinder, C, and cone, D, when constructed and arranged substantially as described and for the purpose specified.

71,914.—APPARATUS FOR TAMING WILD ANIMALS.—Peter R. Sanderson, Caledonia, N. Y.

I claim the construction and use of a circingle strap, as described, with the sheaves, A A A A, and their attachments to said circingle, and the slipping straps, B B B B, and rope, C, when arranged substantially as described for the purpose specified.

Also, the combination of the above parts, A A, etc., B B, etc., and C, with any harness, arranged substantially as described for the purpose designed.

71,915.—JOURNAL BOX.—Wm. Sherburne, Charlestown, Mass.

I claim, 1st, The bolt, E, constructed as and for the purposes above described.

2d, The bolt, E, in combination with the jaw, m, and oil box, B, substantially and for the purpose above specified.

71,916.—HORSE AND CATTLE POKE.—Nelson Sylvester, Weymouth, Ohio.

I claim, 1st, The head, B, cross bar, E, in combination with the springs, F, and spikes, a, for the purpose and in the manner substantially as set forth.

2d, The cross bar, E, as arranged in relation to the yoke, C, and in combination with the poke, A, in the manner as and for the purpose specified.

71,917.—CORN PLANTER.—Frank J. Smiley, Marshall, Mich.

I claim, 1st, In combination with a wheeled machine for planting corn or other seed at regular intervals, a "perambulator," substantially as described, when hung concentrically to a revolving seed cylinder, C, and operated in connection therewith, substantially in the manner and for the purpose herein specified.

2d, When operated in connection with a revolving seed cylinder, the arrangement and combination of the dropping tubes, t, and their attachments with the tappet pins, T, and receiving basins, K, for dropping and conveying the seed to the furrowers, substantially as set forth.

3d, The pendant gage-bars, h, in combination with the gage-plates, g, substantially as and for the purpose described.

71,918.—WHIP RACK.—Charles A. Smith, Philadelphia, Pa.

I claim a whip rack composed of metal or other inelastic material, and furnished with a series of divisions or apartments, with a hinged tongue or flap in each, and suitable openings in each apartment for the insertion and retention of a whip, substantially as described.

71,919.—METHOD OF HARDENING AND BLEACHING ARTICLES MADE OF SOAPSTONE, TALC, ETC.—Henry Julius Smith, Boston, Mass., assignor to Joseph C. Wightman Newtonville, N. Y.

I claim, 1st, The heating in a closed vessel, and in contact with carbon, the above described substances, or articles formed therefrom, for the purpose of hardening and toughening the same, substantially as above described.

2d, The removal, either before or after the hardening process, of impurities producing discoloration, by the action of a bath of melted chloride of sodium, or other chemical compound operating in like manner.

71,920.—HANDLE FOR TEA AND COFFEE POTS.—Enos E. Stow, Plantsville, Ct.

I claim a handle, as made hollow or tubular, and provided with openings in or through it, that when applied to a pot or vessel, warm or heated air may be caused to pass into and through and out of such handle, substantially as and for the purpose specified.

71,921.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the endless wire rope or ropes, A A, pulleys, T T' T", and piers, B B B' B", with the suspended carriages, H H H H, arranged and operating as specified.

71,922.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the wire ropes, A A, piers, B B B B, reel, F, and rope, P, with the carriage, H, arranged and operating in the manner set forth.

71,923.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the two aerial ways, A A' A" A'", the drum, C, with the carriages, H H, and ropes, f f, constructed and operating as specified.

71,924.—ATTACHMENT TO THE REGULATORS OF WATCHES.—Wm. B. Tucker, Hillsboro, Ohio.

I claim the combination of the screw-arbor, c, and the toothed segment, e, with the regulating lever, d, and the scale base plate, a b, substantially in the manner and for the purpose herein set forth.

71,925.—BILLIARD CUE TIP.—Joseph A. Veazie, Boston, Mass.

I claim the new or improved composition, substantially as described, in which ground leather is an important constituent.

Also, the combination of a layer of such composition and one or more layers or strata of leather or caoutchouc, or both, such being for the formation of cue tips, as explained.

71,926.—CAR SPRING.—Richard Vose, New York city.

I claim a volute spring, formed or constructed of a coiled metallic bar, whose thickness is greater transversely upon one edge thereof than at any other point therein, substantially as and for the purpose herein set forth.

71,927.—APPARATUS FOR TURNING ON GAS.—W. P. Wage [assignor to himself and M. Clarke), Barre Centre, N. Y.

I claim, 1st, The cylinder, E, and the piston, F, in combination with the lever, D, or their equivalent, operated by the means and in the manner and for the purpose specified.

2d, Lighting gas by electricity, in combination with the apparatus above described for turning on gas, as shown and described.

71,928.—HORSE HAY FORK.—George H. Waldo, Prattsburg, N. Y.

I claim the tines, b b, bail, f f, curved holding tine, I, spring, J, pulley, l, rope, k, all constructed and operated substantially as herein set forth.

91,929.—MACHINE FOR ROLLING LEATHER.—J. H. Walker, Worcester, Mass.

I claim, 1st, The combination of the horizontal way, G, slide, H, and roll, b, with tables, K and M, and treadle operating device, substantially as and for the purposes set forth.

2d, The combination, with the pieces, C C, of the truss rods, E E, bridge, F, way, G, and slide, H, substantially as and for the purposes set forth.

71,930.—FERTILIZER AND CORN PLANTER COMBINED.—Samuel H. Wallize, Washingtonville, Pa.

I claim the arrangement of the devices, slide, G, and roller, D, as connected and operating together, with the crank, F, so as to drop the guano and corn through a single spout, to prevent choking, as herein described.

71,931.—WASHING MACHINE.—D. T. Ward, Cardington, O.

I claim, 1st, The segmental or convex wash board, E, actuated by levers, D, in combination with the reciprocating washboard, F, and connecting arms, H, substantially in the manner and for the purpose set forth.

2d, In combination therewith, the spring, J, rod, k, and slots, l, arranged and operating substantially as described.

3d, The gate, p, in combination with the horizontal reciprocating wash board, F, and tub, A, arranged and operating substantially as and for the purpose set forth.

71,932.—CORN PLANTER.—John R. Weber, Bourbon, Ind.

I claim, 1st, The springs, m, on the shaft, e, in combination with the dropping cylinders, k, as and for the purpose described.

2d, The combination of the foot board, c', forked lever, d" m", connecting rods, e", and cross piece, h", arranged and operating as explained.

3d, The combination of the frame, B, elbow levers, m', connecting rods, n's', arms, o' t', and shafts, r' n', as and for the purpose set forth.

4th, The combination of the transverse shaft, v, sliding bar, s, hook, r, pins, o, block, n, and dropping cylinders, k, substantially as described.

5th, The combination of the crank, w, arm, x a', spring, b', and sliding bar, s, arranged and operating as set forth.

6th, The combination of the lever, a", shaft, v, pinion, e', and spring, e"', when used independently, or in connection with the frame, B, substantially as and for the purpose described.

71,933.—BED BOTTOM.—David S. Williams, Coldwater, Mich.

I claim the combination of the loop, A, rods, B, spring band, C, rods, D, webbing, E, slats, F, wires or equivalent, G, in the manner described.

71,934.—INSTRUMENT FOR ADMINISTRATION OF ANÆSTHETICS.—Osborn Wilson, Aurora, Ill.

I claim, 1st, The construction of an instrument with inhaling and exhaling tubes, provided with valves, working automatically and alternately in opening and closing the tubes by the respiration of the patient, substantially in the manner and for the purposes as herein specified.

2d, Providing the instrument with a spring valve and air tube for regulating the administration of the nitrous oxide and other anæsthetics, substantially in the manner and for the purposes as herein specified.

3d, The construction and arrangement of stock, A, mouth piece, B, inhaling and exhaling tubes, C' C, plate, D, air tube, E', valve, E, spiral spring, b, valves, c c, rods, d d, fulcra, e e, arm, f, and rod, g, substantially in the manner and for the purposes as herein specified.

71,935.—CIDER MILL AND PRESS.—Martin Winger, Ephrata, Pa.

I claim, 1st, A series of press boxes, D, with perforated sides and an external cogged flange, d, all connected in the form of a wheel revolving horizontally, with its cross-arms, N, secured centrally to a vertical shaft, L, in combination with the bearing, M, and step, O, sustained on a framework, A B B', all arranged substantially in the manner and for the purpose specified.

2d, With the revolving press boxes, D, the press block and central upright, K, E, pulley, G, guides, F, arms, e, in combination with the inclined planes, H and R, all arranged and operating substantially in the manner and for the purpose specified.

3d, In combination with the revolving box wheel, D D N N, and pressing arrangement, the hinged drop bottom, Q, in combination with a series of rollers or pulleys, P, or their equivalents, for the purpose and in the manner shown and described.

4th, In combination with my horizontal box-wheel, the arrangement of the gearing and mill hopper, X, and crushers, W V, pinions, Y S, on shaft, all combined substantially in the manner specified.

5th, In combination with an apple mill, a cider press, with a series of presses in a horizontal revolving wheel, substantially as and for the purposes specified.

71,936.—CURB FOR WATER WHEEL.—Albert Winton, Chambersburg, Pa.

I claim, 1st, The serpentine or double curved chute gates, O O, when formed with surfaces tapering or sloping from their centers towards their ends, and so arranged, relative to intermediately situated diaphragms or plates, r r, that one of the tapering ends of said chute gates, O O, shall project beyond the circumferences of the rims, a a e e, and extend so as to enter slots, or between the prongs of fork like arms, K L K L, to be operated in the manner and for the purpose substantially as described.

2d, The annular adjustable rim, or ring, l l, provided with the fork like arms, K L K L, and with the moving lever or crank, m, and the fulcrum pin, h, all arranged to operate the chute gates, O O, substantially as shown and described.

71,937.—HARVESTER.—James Winters and Charles C. Gapen, Lacon, Ill.

We claim the skeleton frame, A, or its equivalent, provided with an adjustable clevis, and attached to the end of the tongue, or reaping and mowing machines, substantially in the manner and for the purpose herein described and represented.

71,938.—SASH TOP.—Orson E. Woodbury, Madison, Wis.

I claim, 1st, The cam, slotted at B D I, forming bearings at either extremity for the screw or other support, when the cam is operating against the catch, C, at the points, F or O, all as described and for the purpose specified.

2d, The catch, C, with the spikes, G G, constructed and used as and for the purposes hereinbefore named.

71,939.—PEAT AND BRICK MACHINE.—Charles D. Wrightington, Fairhaven, and Benjamin P. Rider, Boston, Mass.

We claim, 1st, In combination with the mold wheel having the series or sets of molds in it, a series of plungers revolving with said wheel and operated in succession by the eccentric journal and frame, Q, substantially as and for the purpose described.

2d, Also in combination with a mold wheel having a series of cogs interposed by a series of concave stops, blanks or abutments upon its periphery, a drive wheel having cogs and a blank surface on its perimeter so that the mold wheel may be moved, stopped and locked by said drive wheel which has a continuous movement, substantially as and for the purpose described.

3d, Also the location and arrangement of the cam over and around the blank on the perimeter of the drive wheel so that while the mold wheel is stopped and locked by said drive wheel which continues its movement said drive wheel shall operate the pushers to discharge the pressed bricks or blocks from the molds, substantially as described.

71,940.—TOY.—Derrick Adams, Lansingburg, N. Y.

I claim an automatic toy having the legs of the horse and the head and arm of the driver actuated by mechanical devices, in manner substantially as herein described and for the purposes as set forth.

71,941.—EAVES TROUGH FASTENING.—Philip Ahn, Brandon, Vt.

I claim the bolt, c, combined with the elastic strap, e, substantially as and for the purpose described.

71,942.—INFLATING RUBBER BALLS.—Henry A. Alden, Fishkill, N. Y., assignor to the New York Rubber Company.

I claim the application to rubber balls or other hollow articles requiring to be distended by inflation of the combined bulb and tube, substantially in the manner and for the purposes herein shown and set forth.

71,943.—REAMER.—Charles Allardice, Cohocs, N. Y.

I claim, 1st, A shank, A, formed substantially as described in combination with the cutters, B, and nut or screw ring, C, the whole operating as set forth.

2d, In combination with the shank, A, cutters, B, and nut, C, the nut, e, bolt, g, and washer, g', formed as described and employed for the purposes specified.

71,944.—BOLT ATTACHMENT TO DOOR LOCK.—William H. Andrews (assignor to Burton Mallory), New Haven, Conn.

I claim the bolt, E, constructed and arranged within the lock case in combination with the follower, F, constructed with a cam, i, and spring, H, so as to hold the bolt securely in both its locked and unlocked position, substantially in the manner herein set forth.

71,945.—MECHANISM FOR PRESENTING PALM LEAF TO LOOMS.—Isaac Angell, Malden, Mass.

I claim for employment in connection with a loom for weaving with palm leaf or similar weft a mechanism substantially as set forth which automatically presents in succession the entering ends or single pieces of weft in such position with relation to the cross sectional form of each that each piece will be carried into the shed or web flatwise.

Also the mechanism for effecting the elevation and release of the weft, substantially as described.

Also the plate, d, with its rectangular perforations and the gate or slide for clamping a single piece of weft projecting through the plate, substantially as shown and described.

Also a mechanism substantially as set forth for "knocking off" the weft raising mechanism when a piece of weft is presented.

71,946.—BLACKBOARD FOR SCHOOLS.—William Arroquuier, Worcester, Mass.

I claim covering the plaster, B, with a coating, C, composed of the ingredients named and applied in the manner above described whereby the proper color and roughness are obtained, as set forth.

71,947.—MODE OF OPERATING SWELL IN MELODEONS.—C. E. Bacon [assignor to himself, George A. Prince and Calvin F. S. Thomas], Buffalo, N. Y.

I claim the arrangement of the swell pedals side by side with the bellows pedals and contiguous to and parallel therewith, for the purpose and substantially as described.

71,948.—MATERIALS FOR TRANSMITTING HEAT.—William C. Baker, New York city.

I claim the employment of salted water, glycerin, or their equivalents, to prevent freezing in transmitting and diffusing heat through ordinary pipes, tubes or radiators for the purpose of warming and ventilating railroad cars, public vehicles and buildings, substantially as herein described.

71,949.—LAMP BURNER.—George E. Baldwin (assignor to E. Miller & Co.), West Meriden, Conn.

I claim the arrangement of the auxiliary or ventilating tube, E, with the wick tube, B, combined with a solid partition, F, in the base of the burner so as to form a close chamber around the tubes and wick adjuster, substantially in the manner and for the purpose herein set forth.

71,950.—AUTOMATIC TOOTH PLUGGER.—Burr Bannister and George F. Green, Kalamazoo, Mich.

We claim, 1st, The combination of an engine operated by means of compressed air with a tooth plugger, for the purpose set forth and described.

2d, The lock, F, in connection with spring, I, operated by cross head of piston rod, in the manner and for the purpose specified.

71,951.—CAR COUPLING.—William F. Barlow (assignor to himself, James Bower and W. A. Jackson), Monmouth, Ill.

I claim, 1st, The catch, C, slotted draw head, A, and weight, X, combined as described and for the purpose set forth.

2d, The rods, M N and H, and elbow, K, combined as described and operating in combination with the elements of the first claim arranged substantially as described and for the purpose set forth.

3d, The weight, X, arranged as described for the purpose set forth.

71,952.—HARVESTER RAKE.—John Barnes, Rockford, Ill.

I claim, 1st, The inclined serrations, h h h, on the face of the rake head for the purpose of compacting the gavel.

2d, A compresser or supplementary rake pivoted to the rake handle and moving parallel to the rake head, substantially as described.

3d, The combination substantially as described of an automatic rake, a compresser and an interposed spring, for the purpose set forth.

4th, The combination substantially as described of a reel revolving continuously on a horizontal shaft a rake mounted on the same shaft (on trunnions arranged diagonally to the shaft), and a shipping device by which the rake may be thrown into gear between any two of the beaters of the reel and by which it may automatically be thrown out of gear at the end of its stroke.

5th, The combination substantially as described of the inclined rake handle with the trunnions or pivots revolving on the reel shaft and arranged diagonally thereto.

6th, The combination substantially as described of the rake handle pivoted on trunnions diagonal to the reel shaft and the friction roller with a guide vertical below the axis of the rake and deflected both horizontally and laterally above that axis, as and for the purpose set forth.

7th, The combination substantially as described of the rake handle and shipping lever whereby the rake throws itself out of gear after discharging the gavel.

8th, The combination substantially as described of a rake mounted on trunnions revolving on a horizontal axis in a fixed relation to the guide which controls the movements of the rake with a revolving reel having an endwise movement on the same axis whereby the rake can be thrown out of gear by moving the reel endwise without stopping the reel.

71,953.—TRY SQUARE AND BEVEL.—Samuel N. Batchelder, Prairie du Chien, Wis.

I claim, 1st, The blade, B, pivoted within the stock, A, and provided with a hooked projection, e, by means of which and the hook slide, D, the blade, B, may be set and held at any desired angle, substantially as described and for the purpose specified.

2d, The hook slide, D, with the thumb screw, E, arranged and operating substantially as shown and described for the purposes set forth.

3d, The spiral spring, F, in combination with a combined try square and bevel, substantially as described.

71,954.—PLATE LIFTER.—David B. Beaty, Anrora, Ind., assignor to himself and James Lamb.

I claim the curved wires, B B B, having hooks at their lower ends and connected to a handle, A, said handle being provided with a wire loop formed into a spring which connects to the wires, B, so that by pressing upon this spring, C, the wires, B, are caused to separate and release the plate, all constructed as specified.

71,955.—SUSPENSION BRIDGE.—Charles Bender, N. Y. city.

I claim, 1st, The construction and arrangement of one or more yielding joints connecting the beams or trusses of stiffened suspension bridges, substantially as herein described.

2d, The attachment of the ends of the cables or chains at or near the first or shore piers to the longitudinal beams or trusses of stiffened suspension bridges, substantially as set forth.

3d, The means and method by which the ends of the beams or trusses of stiffened suspension bridges are secured to the shore piers by vertical anchorage and the arrangement of suitable joints, v, in said anchors, substantially for the purpose described.

4th, The means and method employed to reduce the side motion by attaching the longitudinal beams or trusses of stiffened suspension bridges to the central piers sidewise said attachment being on one pier perfectly immovable in any horizontal direction while at the other piers allowance is made for the variations of the length of the beams, substantially as set forth and described.

71,956.—FOLDING TRUNK.—O. K. Bernbaum, Brooklyn, N. Y.

I claim the folding ends in combination with the hinged sectional back and front, for the purposes herein fully described.

71,957.—SOFA BEDSTEAD.—Charles H. Berry, East Somerville, Mass.

I claim the combination of the lower portion, a, the seat, b, and head, d, and the hinged or movable panel, e, in a sofa or lounge, substantially as and for the purpose described.

71,958.—CHURN.—Thomas Bisbing, Buckstown, Pa.

I claim the combination of the removable frame, B, sliding frame, C, ratchet bar, G, and pinion wheel, H, with each other, with the body, A, of the churn, and with the dasher shaft, I, substantially as herein shown and described and for the purpose set forth.

71,959.—HAT-FELTING MACHINE.—Job W. Blackham, Brooklyn, N. Y.

I claim, 1st, The duplicate series of rolls, b and b', and rubbers, C and C', or their equivalent, with their water pans, N N, and jets of hot water or steam, as represented, arranged to operate together in the manner and for the purpose herein specified.

2d, Mounting the reciprocating rubber over the bed of rolls so as to allow of its ascent and descent by means of springs, substantially as and for the purpose herein specified.

71,960.—BUILDERS' SCAFFOLD.—John E. Bliss, Oxford, Ind.

I claim the combination of the right-angled pivoted frame, A, and adjustable sliding bars, B and D, with each other, substantially as herein shown and described and for the purpose set forth.

71,961.—SUBSTITUTE FOR MILK FOR CATTLE.—Rufus K. Blodgett, near Fulton Ill.

I claim, 1st, The use of white or blue clay, when used for the purpose above specified.

2d, The combination of flour, catechu and clay, when mixed and used for the purposes above set forth.

71,962.—FIRE LADDER.—Johan Blomgren, Galesburg, Ill.

I claim, 1st, The stuffing coil, O, inserted into the lower part of the tube H H', and forced up or down in the tube by the cog wheel, M, substantially as and for the purpose specified.

2d, The basket, R, in combination with a fire escape having the hinged side, T, and the adjusting rod, S, substantially as and for the purpose described.

3d, The construction of the stuffing coil, O, substantially as and for the purpose specified.

71,963.—SAFETY GUN LOCK.—Charles Bowlen, Milwaukee, Wis.

I claim tumbler, F, with its pin, G, in combination with dog, H, with its slot, I, substantially as and for the purpose described.

71,964.—VENTILATOR FOR BUILDINGS.—Thomas Boyd, Cambridgeport, Mass.

I claim, 1st, The combination of the chamber, A, with or without the lenses, B, cone, C, and rods, D, constructed and arranged to operate substantially as and for the purpose set forth.

2d, The combination of the oscillating cap, E, and elastic pads, I, substantially as and for the purpose set forth.

3d, The arrangement of the chamber, A, cone, C, pipes, E and H, and cones, G and K, substantially as set forth.

71,965.—DOOR LATCH.—Purmort Bradford (assignor to Sargent & Co.), New Haven, Conn.

I claim the construction of the latch bolt with the pivot bearings, a and b, upon opposite sides combined with a single central pivot upon the plate so as to be adjustable for a right or left-hand door and the said plate constructed with a slot through which the latch is operated, in the manner herein set forth.

71,966.—PLOW.—Harvey Briggs, Smithland, Ky.

I claim, 1st, Forming the land side, mold board frame and upper and lower strengthening floors, b1 and b2, solid in one piece B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the conical rollers, D, and their boxing frame, H, with the mold board frame, B, substantially as herein shown and described and for the purpose set forth.

3d, Forming the boxing frame, H, in two parts, substantially as herein shown and described and for the purpose set forth.

4th, Forming an oil trench or channel, J, in the boxing frame, H, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the elastic washer or packing, I, with the journals and bearings of the rollers and wheels, substantially as herein shown and described and for the purpose set forth.

6th, The combination of the adjustable friction wheel, F, and stationary friction wheel, E, with the solid land side and mold board frame B, substantially as herein shown and described and for the purpose set forth.

7th, The combination of the vertical flanged friction roller, G, with the land side of the plow, substantially as herein shown and described and for the purpose set forth.

71,967.—PIANO STOOL.—Joshua Briggs, Peterboro, N. H.

I claim, in combination with the pillar and feet, the socket block, m, having recesses formed with side lips or flanges, o, to fit into grooves, q, in the feet and bottom seats, p, between which and the shoulder on the pillar the feet are securely confined, substantially as described.

Also the center piece, w', fitting upon and covering the screw bolt and nut, which confine the pillar to the base, substantially as shown and described.

Also constructing the socket block, m, with a center socket, t, into which the tail piece of the pillar fits and is confined, substantially as described.

Also making the screw spindle removable from the seat, substantially as set forth.

71,968.—PLOW.—T. E. C. Brinly, Louisville, Ky.

I claim, 1st, The mode of attaching the beam, D, to the plows by a socket, C, connected with the land side by braces, B B, substantially as set forth.

2d, The combination of the socket, C, constructed with diagonal flanges, C', the handles, and the beam, substantially as set forth.

71,969.—COMBINED SHOVEL AND SIFTER.—Stephen P. Brooks (assignor to himself and Benjamin Woodward), Somerville, Mass.

I claim the within-described combined shovel and sifter, constructed and operating substantially as set forth.

71,970.—SEAT AND DESK.—A. H. Brown, May's Landing, N. J.

I claim the hinged brace, J, passing through the guides, M, upon the inside of the ends, B, of the seat and hinged to the outer edge of the folding desk, H, all arranged as described whereby the gravity of the brace, J, as the desk is raised causes the L-shaped notch, L, to fit and catch in the guide, M, to hold the said desk raised, for the purpose specified.

71,971.—GRAIN FORK.—E. G. Bullis, Manchester, Iowa, assignor to Charles J. Riggs, same place, and said Riggs assignor to D. E. Lyon, Dubuque, Iowa.

I claim, 1st, The combination of a band-cutting device with a pitching fork, substantially as and for the purposes described.

2d, The combination of the rearwardly-extended parts of the tines, C, the cross head, B, grooved bars, E, sliding cutter, F, and springs, L, with each other, substantially as herein shown and described and for the purpose set forth.

71,972.—SEED PLANTER.—Matthew S. Burdick, Milton, Wis., assignor to himself and John M. May.

I claim, 1st, Thumb screw, I, in combination with part, H, and seed cup bar, D, when constructed, connected together and used substantially as and for the purposes described.

2d, Seed-cup bar, E, or its equivalent, when combined with seed-cup bar, D, in the same planting machine so that corn and pumpkin seed and other flat seeds, as squash and melon seeds, may be planted at one operation, substantially as described.

3d, Spring, O, or its equivalent, attached to and combined with seed-cup bar, E, substantially as and for the purposes described.

4th, Jaws or points, F and G, provided with partitions, h and h, for the purpose of dividing the seed, when used in combination with parts, A and A' B and E and N, substantially as described.

5th, A general arrangement and combination of legs or bars, A and A', hoppers, B and C, seed-cup bars, D and E, covering, N, and jaws, F and G, when constructed, connected together and used substantially as and for the purposes described.

71,973.—PULLEY BLOCK.—John A. Burnap, Albany, N. Y.

I claim the arrangement of the frame, E, and pulley, F, through the eye of which is inserted the frame, A, having a series of rollers, a a, the whole constructed and used substantially as specified.

71,974.—SADIRON.—Jesse S. Butterfield and Joseph A. Reed, Philadelphia, Pa.

We claim, 1st, The steadying pin, d", in combination with the sectors, d'" d'", on the guard-plate, d', the said parts being constructed and arranged to operate in connection with the places, a'" a'", on the projection, a', substantially as and for the purpose described.

2d, The projection, a', on the base, A B, with its two opposite sectors or inclined planes, a" a", constructed and arranged to receive and hold down the inward ends, c" c", of the feet of the handle, C D, substantially as described and set forth.

3d, The projecting ends, c" c", of the handle, C D, constructed and arranged to operate in combination with the spaces, b' b', and planes, a" a", substantially as and for the purpose described.

71,975.—PRUNING SHEAR.—Seth P. Carpenter, Milford, Mass.

I claim the new or improved manufacture of pruning shears, as hereinbefore described, that is, as composed of the blades, a b, the lever, C, the long shank, B, the lever, D, the open handles, C C', the arm, f, and the rod, g, arranged and combined in manner, and for the purpose, and to operate substantially as specified.

71,976.—WASHSTAND AND CLOTHES DRYER.—Frances H. Carrier, Bridgeport, Conn.

I claim, 1st, The combination of the clothes drying apparatus with the wash-basin, when they are constructed, arranged, and fitted for use substantially as herein described and set forth.

2d, The combination of the cups, b c d, or their equivalents, with the wash basin, when they are constructed, arranged, and fitted for use as a toilet apparatus, substantially as herein described and set forth.

71,977.—SPICE CASE.—John T. Carter and John Park, Lowell Mass.

We claim, 1st, The cups or boxes, c c, when arranged to operate substantially as described, and for the purposes fully set forth.

2d, The springs, k k, in combination with the cups or boxes, c c, for the purpose described and set forth.

3d, The combination and arrangement of the case, a, with its feet, d d d, handle, e, loop, f, and shelves, b b b b, cups or boxes, c c, and spring, k k, all all for the purposes substantially as described and set forth.

71,978.—APPARATUS FOR PAINTING OR GRAINING PAILS, ETC.—Jonathan Carter, Winchendon, Mass.

I claim, 1st, The combination of the flexible painting or die printing roll with the supplying roller, for painting, graining, ornamenting pails, or other tapering articles.

2d, The mechanism for holding and revolving the pail, when mounted on a bench or table, in combination with the movable printing or die roll, operating substantially in the manner as and for the purposes set forth.

3d, Casting graining or other ornamental configurations on conical rolls so as to form a continuous body, for the purposes herein described.

4th, Making die or printing conical rolls in sections, and securing them to the staves so as to change their position for making a greater variety of ornamental designs for graining and ornamenting hollow ware, substantially as and for the purposes set forth.

5th, Applying a smooth coat or body of paint or varnish with a flexible roller to pails, tubs, or other articles of hollow ware, substantially in the manner herein set forth.

71,979.—SAWYERS' RULE.—Thos. Carter, Louisville, Ky.

I claim, 1st, A scale so constructed and adjusted that any two of the three quantities of the thickness of the planks, the diameter of the log, and the number of the planks cut or to be cut from the log being given, the third of said quantities is read off from the scale in the manner substantially as above set forth and described.

2d, A scale exhibiting the number of turns to be given to the screws of the log carriage for cutting plank or boards of any desired thickness.

71,980.—CAST METAL CASE FOR SPRING BALANCE.—John Chatillon, New York city.

I claim a cast metal case for spring balances, when provided with a perforated or slotted upper head for the reception of the pin, b, and when made substantially as and for the purpose herein shown and described.

71,981.—VACUUM GRAIN DRYER.—Geo. Clark, Buffalo, N. Y.

I claim, 1st, the three essential features or parts: the air tight grain chamber, the radiating heating pipes or floors, and the vacuum-producing apparatus, combined and operating substantially as herein set forth.

2d, The arrangement of the steam heating pipes within the grain chamber, substantially as set forth.

3d, The graduated gage vessel, H, arranged as and for the purpose set forth.

71,982.—DOOR LATCH.—Francis Clymer, Galion, Ohio.

I claim the mode of attaching a combined latch and hasp, B, and staple, F, to doors, by means of slots, I and H, so as to permit the adjustment of the same substantially as set forth.

71,983.—CLAMP.—Geo. H. Coe and Geo. H. Snow, New Haven, Conn.

We claim the herein described clamp, consisting of the head, C, upon one arm of the body, A, the opposite arm, provided with a corresponding foot, and the said head having arranged therein levers, D, and combined with a screw, B, so as to operate to clamp between the screw and the foot, substantially as set forth.

71,984.—BOAT DETACHING TACKLE.—David L. Cohen, Pensacola, Fla.

I claim the combination of the notched bars, a a, with the grooved blocks, B B, the sliding blocks, C, pitman, D D', and lever, F, substantially as and for the purpose described.

71,985.—APPARATUS FOR ELEVATING WATER.—J. R. Cole, Keston Station, Tenn.

I claim, 1st, The combination of the chamber, F, provided with the short pipes, p p', and the pipes, p", with the pumps, G H, and the chambers, C D E, substantially as and for the purposes described.

2d, The combination and arrangement, for the purpose described, of the chambers, C D E F, pipes, p p' p", P P' P'", and pumps, G H, the latter working alternately, so as to maintain a constant pressure upon the water in the chambers, substantially in the manner specified.

71,986.—TACK HAMMER.—Thomas A. Conklin, New Britain, Conn.

I claim, as a new article of manufacture, a tack hammer, constructed in the manner and with the characteristics herein specified, for the purposes set forth.

71,987.—FLOOR CLAMP.—Wm. Conner and C. W. Mitchell, Wilmington, Del.

We claim the combination of the frame, a, with the screws, b and d d, with the wedge blocks, e e, wedges, f f, and plates, i i, constructed and arranged, as herein described, to operate as a clamp for clamping ship timber, flooring, and other carpenters' work.

71,988.—BUTTON.—Geo. Cooke, Winchester, Mass.

I claim a button or stud, its shank attached by means of a disk formed concave, and subsequently compressed, substantially as described.

71,989.—HARVESTER.—Francis C. Coppage, Terre Haute, Ind.

I claim, 1st, The combination of the double or alternate step wheel, E, having the inclined steps, e e e, with the two stepping-dogs, D D', and the springs, x x, when the said parts are constructed and arranged substantially in the manner and for the purposes described.

2d, The combination and arrangement of the adjusting rod, n o", with the cylindrical sleeve, O, the sleeve or slide, O'", the post, P, and the reel, O'", in such a manner that while the post, P, supports the reel, the elevation of the latter is adjusted by the compound rod, n o", substantially as and for the purposes specified.

3d, The rod, H, having the crank, h, and the worm, h', in combination with the worm segment, I, the shaft, I, the winding arm or segment, I', and the chain, K, substantially as and for the purpose specified.

71,990.—MACHINE FOR STRETCHING CLOTH.—A. C. Corpe, Stafford, Conn.

I claim, 1st, The two gear clamps, B B, composed each of two wheels, a a', one placed above the other, and the upper wheels arranged so as to be capable of adjustment, both vertically and laterally, substantially as shown and described.

2d, The arrangement of gearing, as shown, in connection with the gear clamps, B B, and roller, C, whereby an equal movement of the clamps is insured, substantially as shown and described.

3d, The supplemental frame, E, provided with the roller, D, upon which the cloth is wound, in connection with the gearing, k u, clutch, o, driving pulley, m, and shaft, l, all arranged substantially as shown and described.

71,991.—ROLLER FOR DRESSING.—Benjamin R. Cotton, Lewiston, Me.

I claim as an improved dresser roll, a stone roll covered with the surfacing metal, or metal composition, substantially as set forth.

Also, the method of surfacing a roll by placing around or over a central roll a metal frame as a base upon which to cement the surface metal, and the surfacing such frame, substantially as set forth.

71,992.—WAGON LOCK.—James A. Counts, Indianapolis, Iowa.

I claim the catch, g, the bands, h h, the spring, the bar, e, lever, k, for the purposes set forth and described.

71,993.—HAME TUG.—Jas. C. Covert, Townsendville, N. Y.

I claim, 1st, The metallic hames tug, A, provided with the V-shaped openings, C, having inclined sides, and the tongues, D, adapted to receive the V-shaped block, O, formed upon the block, N, of the trace strap and block, O, held in place by means of the pin upon the spring lever stop, Q, fitting in the groove, P, in the end of tongue, D, of the hame tug, as herein described for the purpose specified.

2d, The hame clip, fastened by bolts to the hame tug, substantially as herein described and for the purpose specified.

3d, The block, N, upon the trace strap, when provided with the V-shaped block, C, and the spring lever, Q, as herein described for the purpose specified.

71,994.—HARVESTER RAKE.—James S. Crump, Williamsburg, Mo.

I claim, 1st, The curved eccentric arm, I, applied to the rock shaft, E, and operated in the manner and for the purpose described.

2d, The swinging lever, M, or its equivalent, in combination with the curved eccentric arm for operating the platform, as described.

3d, The arrangement of one or more springs in combination with the curved eccentric arm, I, for the purpose set forth.

4th, The manner of adjusting the hight of the swinging platform upon the supporting arms and uprights, as described.

5th, The adjustable cant or deflecting boards, C, in combination with the swinging platform, as described.

71,995.—WASHING MACHINE.—S. W. Curtiss, Sugar Grove, Pa.

I claim an improved washing machine, consisting box, A, provided with blocks, H, and roller, E, the hinged frame, B, having rollers, C D, and handle, G, all constructed, arranged and operating as and for the purpose set forth.

71,996.—MACHINE FOR FORMING HAT BODIES.—Francis Degen, Newark, N. J.

I claim, 1st, A hat body formed partly of common and partly of fine stock, by first blowing on the cone a belt of fine stock, then over the whole cone a quantity of common stock, and finally a quantity of fine stock, substantially as set forth.

2d, The close fitting cap, B, in combination with the perforated cone, A, of a machine for forming hat bodies, substantially as and for the purpose described.

3d, The slide, D, in combination with the trunk, C, cap, B, and perforated cone, A, substantially as and for the purpose set forth.

71,997.—MAIL-BAG FASTENER.—S. Denison, Portlandville, N. Y.

I claim the hooks, C, constructed substantially as herein shown and described, in combination with the straps, D and F, with the bag, B, and staples, A, as and for the purpose set forth.

71,998.—SAWBUCK.—Henry J. Dill, Cummington, Mass.

I claim the clamps, D, the treadle, E', the arms, E, springs, F', and rods, F, constructed, arranged, and operating, in combination with the stationary part, A, substantially as shown and described for the purpose set forth.

71,999.—CARRIAGE FOR ROCK DRILL.—Thomas Doane, Boston, Mass.

I claim the arrangement of the round bars, E F G and H, of a rock drill carriage into a frame, for the reception of rock drilling machines which shall be able to reach therefrom any point where it is desirable to bore a hole, substantially as and for the purpose described.

2d, The position of the horizontal round bars, E and F, under an acute (more or less) angle, d, to the side frame of a rock drill carriage, or to the alignment of the tunnel, substantially as and for the purpose set forth.

3d, The construction of a rock drill carriage for driving a tunnel or mine so as to swing in a vertical direction on the forward wheels and axle, substantially as and for the purpose specified.

72,000.—RAILWAY CHAIR.—John H. Downing, Salem, Mass.

I claim the single-headed chir, A, in combination with a sectional railroad rail, arranged as and for the purpose shown and described.

72,001.—ROTARY PUMP.—John Doyle, Hoboken, N. J., and Timothy A. Martin, New York city.

We claim the two drums, A C, placed concentrically one within the other, the chamber, D, air passages, E E', valves, F G, and tubular journals, B B', all arranged and combined to operate in connection with water or other liquid placed in the space or spaces between the two drums, A C, substantially in the manner as and for the purpose specified.

72,002.—GRINDING MILL.—James F. Drummond, New York city.

I claim the tubular inlet-journal, b, having its interior contracted around the feed pipe at one point, and thence flaring toward the cylinder and the blast pipe, substantially as and for the purpose specified.

72,003.—PIVOT GEARING.—Joseph J. Duchesne, Lacon, Ill.

I claim the circular bed plate, A, in combination with the pinion plate, B, and coupling plate, C, secured by the set screw, S, the whole arranged and operating substantially as and for the purposes set forth.

72,004.—CULTIVATOR.—William Duffner, Petersburg, Ind.

I claim the cultivator composed of the elements, A B B' C D E F H I J N, and the device for regulating the depth of the shovels, composed of the elements, G K L M P, constructed and arranged as set forth.

72,005.—WOVEN FABRIC.—J. Renshaw, East Greenwhich, R.I.

I claim the fabric, herein described, as a new article of manufacture.

72,006.—HORSE RAKE.—Edward A. Field, Sidney, Me.

I claim, 1st, The application of each tooth, E, to its arm, D, by means of a round tenon arranged at an obtuse angle with the axis of the tooth, and going into the arm, the same being substantially as and for the purpose described.

2d, Also, the combination as well as the arrangement of the adjustable brace, d, and the staple or clasping wire, f, with the arm and the tooth, when applied by means substantially as specified, viz., a cylindrical tenon arranged at an obtuse angle with the axis of the tooth, and going into a corresponding hole made in the arm.

3d, Also, the combination of the clamping screw, h, with the arm, and the tooth applied to such arm by a tenon arranged at an obtuse angle with the axis of the tooth as specified.

4th, Also, the arrangement of the rope, or its equivalent, with the several arms and their teeth, and the braces thereof, the said rope being to operate as and for the purpose specified.

72,007.—PUNCH FOR FORMING CLASP.—Charles D. Flesche, New York city.

I claim the sliding punch, B, in combination with the plates, A A', cutters, b b, and spring, e, substantially as and for the purpose herein shown and described.

72,008.—SELF-FASTENING SPRING FOR WEBBING.—John Flinn, Philadelphia, Pa., assignor to Archer Steel, same place.

I claim a spiral spring, for webbing, having the wire at one end of the spiral coils, A A, bent in the manner described and shown by B C D E, for the purpose specified.

72,009.—CARVING KNIFE AND FORK HOLDER.—Alden T. Foster, Albany, N. Y.

I claim, as an article of manufacture, the dish or stand, A, constructed substantially as described, with notches, a a and c c, as and for the purpose set forth.

72,010.—LAMP CHIMNEY.—Sam'l W. Fowler, Brooklyn, N.Y.

I claim the construction of the glass chimney, with its concave and convex deflectors, J and E, on each side, and collar, B, beneath, with its projections, C C, as herein described and for the purposes set forth.

72,011.—CARTRIDGE BOX.—William Freeborn, Tivoli, N. Y.

I claim the square box, A, made of leather or any suitable material, when constructed with a series of round, fluted, or ruffled holders, B, on the inside, made of any firm or flexible material, a series of holders, B, being attached to each flap, C, in front, and the flaps buttoning to the sides of the box, A, as herein described and for the purpose set forth.

72,012.—DEVICE FOR HITCHING HORSES.—Samuel Galbraith, New Orleans, La.

I claim the device above described, consisting of the rings, A and B, and the pivoted curved jaws, C C, meeting at one extremity at e' e', and connected at the other by means of the rods, r r, and springs, s, working in the tube, substantially as and for the purpose specified.

72,013.—CAPPING SCREWS.—J. Gardner, New Haven, Conn.

I claim, 1st, Cutting away or depressing the cap at the point where it meets the nick in the screw head, substantially as described, so that such cut away or depressed portion, while connected with and forming part of the cap shall lie within or line the nick in the screw head, as set forth.

2d, A capped screw in which the slot or depression in the cap corresponding to the nick in the screw head is formed, substantially in the manner and for the purposes herein shown and described.

72,014.—TIGHT AND LOOSE PULLEY.—Joseph P. Gates, Lincoln, Ill.

I claim the construction of the pulley, e, in two sections, with the arrangement and combination of the ram spring, F, the rebound guard, G, the stop flange, I, the case dog, J, and spring, K, the case-dog ram, L, the shuttle key, P, and stands, Z, and arm, b, with cam, a, when constructed, arranged, and operated as herein described, and for the purposes set forth.

72,015.—BRICK MACHINE.—Samuel Gissinger, Allegheny City, Pa.

I claim, 1st, The device for moving the mold on to the roller way, G, consisting of the arm, l, held by a spring, m', lever, m, pin, n, on the gear wheel o, and block, j, moving in the slot, h, substantially as described.

2d, The device for moving the molds under the hopper, consisting of the gear wheel, p, operated by the gear wheel, o, arm, k', and block, k, moving the slot, l, substantially as described.

3d, In combination with the above, the gear wheel, o, shaft, B, grinding knives, C, stationary knives, D, and rollers, F, in the hopper, A, substantially as and for the purposes described.

4th, The roller way, G, provided with openings and rollers, g and g, substantially as and for the purposes described.

72,016.—HARVESTER RAKE.—James H. Glass and Albert J Glass, McGregor, Iowa.

We claim, 1st, The combination of the wheel, L, with the rake wheel, A and arms, C, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cam, O, and bent or crooked lever, M, with the shaft N, of the gear wheel, L, and with the arm, I, rigidly connected with the switch, F, substantially as herein shown and described and for the purpose set forth.

72,017.—METHOD OF MOLDING PLASTIC MATERIAL.—Wm. B. Gleason, Boston, Mass.

I claim the process substantially as and for the purposes specified.

72,018.—HAND CULTIVATOR.—Wm. C. Goodwin, Hampden, Conn.

I claim, 1st, The combination of the frame, C, with frame, G, and the set screws, x and y, and binding screw, f, when they are constructed, arranged, and fitted for adjusting the blades, substantially as herein described and set forth.

2d, The combination of the blade with the foot and shank, when the foot is made with a keel, like v, to guide the blade and strengthen the shank, substantially as herein described and set forth.

3d, The combination of the handle, D, with the frame, G, when the handle is made adjustable by means of the tongue, h, and set screw, j, and the whole is constructed, combined, and fitted for use substantially as herein described and set forth.

72,019.—APPARATUS FOR MAKING DIPPED CANDLES.—Peter R. Gottstein, Houghton, Mich.

I claim, 1st, The combination and arrangement, substantially as described, of the weighted cistern, B, car, A, and straps, C, for the purpose set forth.

2d, The combination of the cistern, B, car, A, and track, I, substantially as and for the purpose described.

3d, The combination and arrangement of the slab or board, J, with the weighted cistern, B, substantially as and for the purpose described.

4th, The new process of producing dipped candles by raising the molten tallow or other liquid to the wicks, substantially as described.

72,020.—CORN SHELLER.—Joseph Gould, Grinnell, Iowa.

I claim, 1st, The combination of the shaft, A, with the cylinder, B, having its teeth placed upon its face in the manner herein described, and placed within the box between the stationary board, b, and adjustable board, F, by means of its curved springs or oblong slot, when used in combination with metallic inclined plane, E, and hopper, B, with false bottom, as herein set forth.

72,021.—KNIFE CLEANER.—Lewis Goulding, Medfield, assignor to himself and James E. Carpenter, Foxborough, Mass.

I claim, 1st, The combination in an implement for scouring knives, of the bar, B, with its adjustable pad, g, arranged for operation as and for the purposes herein shown and described.

2d, Also in combination with the board or tablet, A, the bar, B, provided with the scouring pad, g, and pivoted to such board, and operating with its upper surface, or upon an inclined bed formed thereon, essentially as herein set forth and explained.

3d, Also the combination with the bar, B, and its pad, of the knife bed and the inclosure for holding and receiving the scouring material, arranged relatively to each other and to the bar, B, as herein shown and set forth.

72,022.—FENCE POST.—David M. Graham, Evansville, Ind.

I claim, 1st, The construction of double portable fence posts, attached by metallic bevel clasps, with flanges, slots, and tongues, and secured by keys, substantially in the manner and for the purposes as herein described and shown.

2d, The adjustable anchors or braces attached by metallic eyes and key, and the combination of the feet of the posts and base, substantially in the manner and for the purposes as herein described.

72,023.—STEAM GAGE.—Albert S. Greene (assignor to John F. Olmsted), Washington, D. C.

I claim, 1st, The construction of a steam gage with two columns of mercury, A and F, communicating with each other at their lower extremities by means of the flexible diaphragms, c and d, and the solid double-headed lifter C, substantially in the manner and for the purpose as herein set forth.

2d, The solid double-headed lifter, C, in combination with the flexible diaphragms, c and d, and the primary and secondary reservoirs, substantially in the manner and for the purpose as herein set forth.

3d, The transmission of the pressure of steam from one column to the other by means of a solid double headed lifter, in combination with the flexible diaphragms, c and d, substantially in the manner and for the purpose as herein set forth.

4th, Providing the primary reservoir, I, with the screw plunger, H, substantially in the manner and for the purpose as herein set forth.

72,024.—MACHINE FOR WALL BUILDING AND STUMP EXTRACTING.—Thomas S. Greenman, Mystic Bridge, assignor to George W. Packer, Jr., Mystic River, Conn.

I claim, 1st, The within described novel construction of a truss for a wall building machine, the same consisting in the pyramidal framing, A B B, the horizontal timbers, D D, uprights, E F, holding-down bolts G J, and inclined braces, I H, combined and arranged substantially as and for the purpose herein set forth.

2d, Also in such truss firmly securing the timbers, D D, to the pyramidal framing, A B B, by enlarging and bolting, or equivalent fastenings, at the points of contact, in addition to the truss work before described, substantially as and for the purpose herein specified.

3d, Also the diagonal arrangement of the holding-down bolts, G, at the front of my truss, the same being arranged relatively to the timbers, D, triangular frame, A B B, and their several connections, substantially in the manner and for the purpose herein set forth.

72,025.—WINDOW SCREEN.—A. W. Griffith, Roxbury, Mass.

I claim the roller cover, E, in combination with the removable screen, D, spring roller, C, sash, A, and window frame, as herein described for the purpose specified.

72,026.—FERTILIZER.—Wm. C. Grimes, Ladiesburg, Md.

I claim forming a fertilizer in the manner herein described, of the ingredients and proportions substantially as specified.

72,027.—CULTIVATOR.—John Gross and John C. Tunison, Decatur, Ill.

We claim, 1st, the arrangement and combined action of the two frames, so that when any permanent obstruction comes against any of the plows the frames will disconnect, and the back frame ride or move up on the front one and thus avoid breakage, substantially as described.

2d, Also a frictional spring hook upon the tongue or tongue frame, for catching or holding upon a cross bar of the rear frame so that the two frames will not disconnect until the pressure upon the plow or plows exceeds that for which the hook has been adjusted, substantially as described.

72,028.—HOSE SHIELD.—John A. Hasse, Philadelphia, Pa.

I claim the combination of the floor or footway, C, with the side pieces, b b, of a sectional hose bridge, constructed substantially as described.

72,029.—SKY ROCKET.—John W. Hadfield, Newtown, N. Y.

I claim the application of detachable wings to a sky rocket, through the medium of a collar or band, arranged so that the wings may be detached from the collar or band, or the latter detached from the rocket, substantially as shown and described.

72,030.—SKY ROCKET.—John W. Hadfield, East Williamsburg, N. Y.

I claim the attachment to a sky rocket of three or more sticks, at equal distances apart, substantially in the manner and for the purpose set forth.

72,031.—MACHINE FOR REFITTING CONICAL VALVE.—Chas. F. Hall, Brooklyn, N. Y.

I claim, 1st, A milling tool with one or more cutters attached to one or more arms or longitudinal sections of a cone, whether straight or oblique, whereby conical valves of different sizes may refitted, constructed substantially as shown and described.

2d, In combination therewith the yielding center, C, substantially as described.

72,032.—COLLECTING OXIDE OF ZINC.—Geo. C. Hall, Brooklyn, N. Y.

I claim, 1st, A building, structure, or compartment, A, provided with openings, a, covered by screens, B, substantially as and for the purpose set forth.

2d, A screen for separating the oxide of zinc from the fumes and gases of burning zinc ore, composed of ground cork, hair, wool, sponge, or other suitable or similar material, confined within a suitable chamber, substantially as set forth.

72,033.—REGISTER FOR ODOMETERS.—Henry F. Hart, New York city.

I claim the arrangement in an inclined position of the counting wheels, 1, 2, 3, 4, 5, and 6, upon shafts of equal lengths, in combination with the notched and perforated lid, B, as herein shown and described.

72,034.—NECKTIE.—Wm. H. Hart, Jr., Philadelphia, Pa.

I claim a bow or tie, A, having an elastic loop or cord, B, arranged horizontally at its rear, with both of its ends free, for the purpose substantially as described.

72,035.—ELLIPTIC CARRIAGE SPRING.—Horace R. Hawkins, Akron, Ohio.

I claim an elliptical carriage spring composed of a single piece, F, or two separate pieces, E E, of steel, united by means of blocks and bolts, substantially as herein shown and specified.

72,036.—HATCH-LINING DRAWINGS.—E. K. Haynes, Hanover, N. H.

I claim a straight-edge or scale having a mechanism for effecting an intermittent movement of the same, substantially as described.

Also in combination therewith, the tongue, q, for angular lining, substantially as described.

Also in combination with the feed mechanism, a mechanism for presenting the straight edge in positions radiating from a center, substantially as set forth.

72,037.—PLATFORM SCALE.—D. Hazzard, Milton, Del.

I claim the hollow stand, A, the spindle, C, the springs, D, the elastic rod, G, and the graduated plate, H, in combination and arranged substantially as shown and described for the purposes set forth.

72,038.—PIANO LOCK.—Adam Helmstaedter, Newark, N. J

I claim the pin, a, secured in the oscillating hook, C, and catching in a slot in the hook, C', substantially as and for the purpose described.

72,039.—TWEER.—John B. Himberg, Frederick City, Md.

I claim a tweer consisting of the box, A, annular cover, C, with a convex under side, and of the removable ring, E, from which the concave plate, F, is suspended, all made and operating substantially as herein shown and described.

72,040.—LAMP FOR BURNING PETROLEUM.—James Hinks and Joseph Hinks, Birmingham, England.

We claim, 1st, Constructing the burners of the said lamps substantially in the manner hereinbefore described and illustrated in Figs. 1, 2, 3, 4, 5, and 6, of the accompanying drawings, that is to say, the combination in the same burner of two or more flat or curved wick cases or holders, in which two or more flat wicks are placed, so as to produce thereby two or more flat flames or elliptical or nearly circular flames.

2d, Constructing and arranging the shade holders or galleries of the said lamps for the purpose of admitting air to the flames, substantially in the manner hereinbefore described, and illustrated in figs. 7, 11, 12, 13 and 14, of the accompanying drawings.

3d, Supporting the shade holders or galleries in a vase or cup on the top of the pillar of the lamp, and supplying air to the lamp through the said pillar or vase, or supporting them in a cup or vase without a pillar, the air in this case being supplied through the vase, substantially in the manner hereinbefore described, and illustrated in fig. 7 of the accompanying drawings.

4th, The improvement described and illustrated in figs. 11, 12, 13, and 14, of the accompanying drawings, for isolating the shade from the shade holder or gallery.

5th, The arrangement or combination of the parts of punkah-protectors or wind protectors, substantially in the manner hereinbefore described, and illustrated in figs. 7, 8, 9, 10, 11, 15, and 16, of the accompanying drawings.

72,041.—DEVICE FOR LASHING AND BINDING.—John M. Hirlinger, Red Rock, Pa.

I claim the cord, A, provided with the links, B and C, hooked lever, D, and slide, E, with its ring, a, arranged and used as and for the purpose set forth

72,042.—TOOL FOR OPENING FRUIT CANS.—Horace Holt, New York city.

I claim, 1st, A tool for opening sheet metal cans, composed of a hand lever, B, carrying a tooth, c, and connected to tongs, A, or other equivalent means, capable of clamping said tooth-carrying lever to the can, as set forth.

2d, Placing the tooth, c, in an oblique direction, when the same is used in combination with the hand lever, B, and clamping device A, substantially as and for the purpose described.

3d, The raised bearing, d, in combination with the lever, B, and clamping device, A, substantially as and for the purpose set forth.

72,043.—MOP WRINGER.—Zadok Howe, Lowell, Mich.

I claim the treadle, G, and spring bail, E, in combination with the rollers, B and C, the same being used as and for the purpose specified.

72,044.—MACHINE FOR MAKING EYELETS.—David K. Hoxsie, Providence, R. I.

I claim the combination of the eyelet forming punch, C, the eyelet forming die, e, and the punch, G, arranged and operating substantially as herein described, for the purpose set forth.

Also, in combination with the eyelet forming punch, J, and cutting punch, H, as described, the spring or snapper, g, arranged and operating substantially as described, for the purpose specified.

72,045.—RAILWAY SLEEPING CAR.—George W. Hunt, Hopkinton, Mass.

I claim the construction and arrangement of the backs of car seats, by which the whole of some of the backs, and parts of others, are formed into berths, in connection with adjacent seats, substantially as described.

Also, the combination of the leaves, n p, and q, hinged as shown, and to fold together, for a day car, or to be extended and made into a berth for a night car, substantially as described.

72,046. — HARVESTER. — George M. Jackson, North Hector, N. Y.

I claim the arrangement and combination of the toothed wheels, S and T, crank, U, box, W, of the hinged frame, V, adjustable finger bar, J, hoisting rope or chain, Y, and lever, Z, when constructed and operated as herein described and for the purposes set forth.

72,047. — REVERSIBLE SADIRON. — S. M. Johnson, Lockport, N. Y.

I claim, 1st, The combination, with a reversible sadiron, A, of the hollow handle, C, forming a reservoir, i, the pipe, D, leg, I, and set screw, H, or or equivalent, arranged and operating substantially in the manner and for the purpose set forth.

2d, Also, in combination therewith, the pipe, E, provided with burner, e, cone, G, and stop-cock, F, arranged and operating substantially as specified.

72,048.—BOOT AND SHOE.—William Keats, and John Keats, Street, England.

We claim the construction of coverings for the feet, substantially hereinbefore set forth, that is so say, with the sole cut at the edge, and sewed to the edge of the upper while turned outward, substantially as described.

72,049.—MUFF.—M. A. King, New York city.

I claim a muff provided with the skeleton spring frame B, made in sections, for the purpose of sustaining its cylindrical form, and adapting it for use as a reticule or pocket, substantially as shown and described.

72,050.—HORSE HAY FORK.—Alfred Knapp, North Fairfield, Ohio.

I claim the hinged chisel, c, in combination with the main piece, A, rod, B, brace piece, G, and holder, D, constructed substantially as described, and for the purposes set forth.

72,051.—FIFTH WHEEL FOR CARRIAGES.—Joshua Lawrence, Palmyra, N. Y.

I claim the combination of the housings, a a, inclosing the rollers, b b, with the bows, G H, the whole conducted and arranged as described, and operating in the manner and for the purpose set forth.

72,052.—WASHING MACHINE.—J. Q. Leffingwell, Nevada, Iowa.

I claim the combination of the semi-cylindrical box, D, segment, W, pinion P, parts, m m', lever, H, and ribs, r, as herein described, for the purpose specified.

72,053.—DOOR-FASTENER.—Francis C. Levalley, Warnerville, N. Y.

I claim the sliding wedge bolt, F, in combination with the sliding spring catch, K, and cases, E J, as herein described, for the purpose specified.

72,054.—CONDENSING ENGINE.—William A. Lighthall, New York city.

I claim the arrangement of the ordinary jet condenser, B, air pump, D, and hot well, E, with the surface condenser, F, and the valves, H K, and L, as shown and described, so that the change from the use of the jet condenser can be made at will, and *vice versa*.

72,055.—MACHINE FOR FORMING AND TEMPERING ELLIPTIC SPRINGS.—Geo. S. Long, Bridgeport, Ct.

I claim, 1st, A steel spring former, substantially as shown and described, and for the purposes set forth.

2d, The vibrating rod, B, and shoe, f', and any former, F, in combination with the slotted wheel, W, and roller, W', substantially as shown and described, and for the purpose set forth.

3d, The hollow shaft, s', and roller, W', in combination with the binder or presser, D, substantially as shown and described, and fo the purposes set forth.

4th, The sliding crank pin, p, in combination with the slotted wheel, W, and slotted vibrating rod, B, substantially as shown and described, and for the purposes set forth.

72,056.—FURNACE FOR HOT AIR BLAST.—Richard Long, Chillicothe, Ohio.

I claim, 1st, Constructing the air pipe of a furnace-blast heater of fire clay, substantially as described.

2d, Constructing the air pipe of an oval or other equivalent form, and uniting the sections of which it is composed by socket joints, with clumps and keys, substantially as shown and described.

3d, Forming the supporting walls, B, of fire brick, with iron plates between the courses, substantially as shown and described,

4th, Placing an open or a solid plate beneath the air pipe, substantially as and for the purposes herein described.

72 057.—CLOTHES RACK.—Eugene F. Lyman, Indianapolis, Ind.

I claim the combination and arrangement of the semi-circular racks, G and H, the arms, f and e, the sockets and staples for the arms, and the box, A B C D, all operating substantially as and for the purpose specified.

72,058.—CENTER BOARD FOR VESSELS.—E. J. McFarlin, San Francisco, Cal.

I claim the location of the center boards, or other equivalent devices for the same specific purpose, in the extreme bow and stern of vessels, that is to say, the placing of the said boards forward of the foremast or aft of the mainmast, in two masted vessels, and forward of the foremast and aft of the mizzen mast in three masted vessels, substantially as shown and described, and for the objects and purposes specified.

72,059.—REGISTER POINTS FOR PRINTING PRESS.—R. W. McGowan, New York city.

I claim, 1st, The pivoted or jointed pointer, B, having a spring or equivalent weight attached, and arranged to operate in the manner substantially as and for the purpose set forth.

2d, The tube, A, provided with the slotted cap plate, b, and the nut, C, when used in connection with the pointer, for the purpose specified.

72,060.—ROOFING.—Orville Manly, Garrettsville, Ohio.

I claim, 1st, a roof composed of tiles, a and b, having spaces, S, between them for a water tight cement, substantially as shown and described, and for the purposes set forth.

2d, The saturated tiles, a, and the saturated tiles, b, substantially as shown and described, and for the purposes set forth.

3d, The lower or outer row of tiles, b, when laid together, forming an eaves trough, substantially as shown and described, and for the purpose set forth.

72,061.—REFINING CAST IRON AND CONVERTING IT INTO STEEL.—Emile Martin and Pierre E. Martin, Paris, France.

We claim the method and means for refining and converting cast iron into cast steel and other metals, substantially as herein shown and described.

72,062.—STRAW CUTTER.—John W. Mauzy, Richmond, and James Hughes, Cambridge, Ind., assignor to James Hughes.

We claim, 1st, The combination of the side pieces, D D, constructed as described, containing the bearings for the cutting mechanism, the shearing bar, B, with square faces, and the spirally bladed knife, C, arranged substantially as described.

2d, The combination of the perforated rollers, E, ratchet wheels, F, pawls, H1, I and K, adjustable oscillating arm, G1, eccentric rod, L, and eccentric, M, respectively, constructed and arranged substantially as set forth.

3d, The arrangement of the cap, G, rollers, E E, covers, Q, sides pieces, D D, knife, C, and the driving and the feed mechanism, constructed and combined substantially as set forth.

4th, The feed rollers, E, when constructed from sheet metal, and punched from the inside, forming projections as shown, for feeding the straw to the knife.

5th, The metallic side pieces, D D, constructed as described, in combination with the bar, B, knife, C, feed rollers, E E, arranged substantially as set forth.

6th, The combination of the eccentric, M, on the knife shaft, eccentric rod, L, and oscillating arm, G1, when the latter are so arranged as to regulate the cut by adjusting the point of attachment, substantially in the manner set forth.

72,063.—CONVERTIBLE SHOT GUN AND RIFLE.—Samuel McCulloch, Yellow Springs, Ohio.

I claim, 1st, The removable barrel, C, constructed with external collars, c, and secured within a shot gun barrel, A, by a screw, D, substantially as and for the purposes set forth.

2d, Also the plug, F, for the purposes set forth.

72,064 —DERRICK.—D. J. McDonald, Gold Hill, Nevada.

I claim, 1st, The derrick standard, L, and frame, K, fitted in the derrick frame, J, and arranged as shown, for the ready adjustment of the standard, L.

2d, The fitting of the derrick frame, J, on the wagon frame, as shown, to wit, by means of the circular plate, D, frame, F, and circular plate, G, with the wheel, E, and pinion, Y, to admit of the ready turning of the derrick, as set forth.

3d, The supports, D, provided with screws, a, and attached to the frame, B, as shown, in connection with the levels, b, in platform, C, for the purpose of levelling the device, substantially as described.

4th, The annular platform, C, applied to the wagon, A, when used in combination with a revolving derrick frame, J, substantially as and for the purpose specified.

72,065.—AUGERS.—John A. McGee (assignor to Theodore Mace), New York city.

I claim the boring instrument formed with a cutting edge extending outwardly from the base of the tapering screw, and curved backwards and downwards until it intersects the periphery of the tool, as and for the purposes set forth.

72,066.—DRY DOCK.—Israel J. Merritt, New York city.

I claim, 1st, The arrangement and combination, with a floating section or dock, A, of one or more wells, through which a lifting chain or chains are passed down to the vessel or object to be raised, substantially as described.

2d, The arrangement and combination of the lever, J, with the floating dock or section, A, and chain or chains, C, substantially as described.

3d, The shape of the well, B, the same being made flaring from its top downwards, so as to allow the chains to go or be conducted from the mouth of the well directly towards the vessel or object to be raised, substantially as shown.

72,067.—KNIFE AND FORK CLEANER.—John Merritt, New York city.

I claim, 1st, The combination of the circular disks, D, leather or equivalent rubbers, K, shaft, A, holding plates, E E', adjusting nut, G, and adjusting screw, I, with each other and with the box, B, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the friction wheel, O, brush, N, and shaft, L, with each other, and with the disk, D, and box, B, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the lever, M, spring, P, and hook, R, with the brush shaft, L, and box, B, substantially as herein shown and described, and for the purpose set forth.

72,068.—MANUFACTURE OF LAMP BLACK.—A. Millochau, New York city, assignor to R. N. Perlee, Jersey City, N. J.

I claim the method herein specified of manufacturing lamp black by condensing the carbonaceous vapors upon a surface directly over the flame, that is constantly kept sufficiently cool by artificial means.

72,069.—CAR BRAKE.—James Mitchell, La Porte, Ind.

I claim, 1st, The combination of the lever, A, rod, B, lever, C, pawls, D and D1, spring, D2, and ratchet wheel, E, substantially as and for the purpose set forth.

2d, The combination of the shaft, E3, collar, R, arm, R', collar, S, and shaft, I, substantially as set forth.

3d, The combination of the shaft, I, spiral collar, U, lever, T, and arm, R, for disengaging the brakes, substantially as set forth.

4th, The combination of the ratchet bar, P, with the inclined face, P1, and catch lever, G, substantially as and for the purpose set forth.

5th, The combination of the ratchet bar, P, with its shoulder, P2, and the lever, T, substantially as and for the purpose set forth.

72,070.—AUTOMATIC TABLE FOR TEACHING.—Hannah Munson, Rockford, Ill., administratrix of the estate of Wm. C. Munson, deceased.

I claim the combination of the frame, A, with its pivoted pointers, C C, and hooks, c c, and movable bars, B B, with pointers and charts, D, as constructed, the whole being arranged and used substantially as and for the purpose specified.

72,071.—HYDRANT.—John G. Murdock, Cincinnati, Ohio.

I claim, 1st, The hollow plunger, E, having the interior valve, I, and sleeve packing, F, which respecively close and encircle the supply and waste pipe, B, as and for the purpose set forth.

2d, In combination with the supply and waste pipe, B, and valve, I, the vertically adjustable hollow plunger, E, for the object stated.

3d, The adjustable shoulder or lock nut, J, in combination and arrangement with the elements, B, D, I and E.

4th, The arrangement of internally packed plunger, E, which surrounds and packs a vertical supply pipe, B, having one or more waste ways, D, and being enclosed within and guided by a cup, C, substantially as described.

72,072.—CLEANER FOR LAMP CHIMNEYS.—R. B. Musson, Champaign, Ill.

I claim a cleaner for lamp chimneys, bottles, and other articles of a similar character, consisting of strips of rubber, or other soft elastic substance, secured to a holder, and arranged in manner and for the purposes substantially as above set forth and described.

72,073.—BOOT AND SHOE HEEL.—Erastus Newhall, Lynn, assignor to himself and John R. Moffitt, Chelsea, Mass.

I claim a heel made with a circular tread and a corresponding seat, when one or both of the two parts are made of elastic material, and are united substantially as described.

72,074.—PORTABLE HOT AIR CONDUCTOR.—John B. Oldershaw, Baltimore, Md.

I claim a portable hot air receiver and conductor, constructed, arranged and operating in connection with a stove, for the purpose of heating apartments above it, substantially as described.

72,075.—VINE HOLDER.—Garret J. Oiendorf and Albert O. Parshall, Middlefield, N. Y.

We claim, 1st, The frame, A, constructed as described and set forth, for the purpose specified.

2d, The cord, B, combined with and supported by frame, A, as described and set forth, for the purpose specified.

72,076.—BREECH-LOADING FIRE-ARMS.—Henry O. Peabody (assignor to the Providence Tool Company), Providence, R. I.

I claim combining the breech block, A, hinged at its posterior extremity, and operating as described, with the hammer, D, by means of the protuberant inclined plane, C, or its equivalent, substantially as described for the purposes specified.

72,077.—RAILWAY CROSSINGS.—Stanhope Perkins, Fairfield, England.

I claim forming the points or V-parts of crossings, without splice, by bending the rail, prepared as above described, back upon itself, and securing the abutting parts in the manner and for the purpose above set forth.

72,078.—MANUFACTURE OF LAMP BLACK.—R. N. Perlee, Jersey City, N. J.

I claim the method herein specified of manufacturing lamp black, by introducing atmospheric air to the flame, by artificial means, for the purposes set forth.

72,079.—AXLE BOX.—Henry B. Pitner, La Porte, Ind.

I claim, 1st, An axle box, substantially as shown and described, and for the purpose set forth.

2d, The sleeve or thimble, A, in combination with the end pieces, B, substantially as shown and described, and for the purposes set forth.

3d, The shoulder, a1, and the shoulder, a2, in combination with the sleeve, A, and end pieces, B, substantially as shown and described, and for the purposes set forth.

72,080.—RAILWAY CHAIR.—Leander Pollock, (assignor to himself and John P. Schenck, Jr.), Matteawan, N. Y.

I claim 1st, A railroad-chair which is divided by an inclined line drawn through the base, into two parts, A and B, each part carrying one of the cheeks, and all made and operating substantially as herein shown and described.

2d, Interposing an elastic plate, g, between the edge of the upper base, d, and the stationary cheek, a, substantially as and for the purpose herein shown and described.

72,081.— VENTILATING HAY-MOWS.— Geo. Race, Norwich, N. Y.

I claim making vertical perforated pipes, having lateral branches extending out from the main pipe for the purpose of ventilating hay-mows, and stacks of hay or grain, substantially as herein set forth.

72,082.—PNEUMATIC CAR.—Louis Ransom, Lansingburg, N. Y.

I claim in combination with a pneumatic car, a series of metal cylinders, for containing compressed air, the said cylinders being connected by pipes, so as to form one common reservoir substantially as described.

2d, I also claim the combination, with a stove for warming the car, or other heating apparatus, a conducting pipe, for the compressed air, so located with reference to the stove or other heating apparatus that the compressed air in passing through it will become heated, and have its expansive power increased thereby, substantially as described.

3d, I also claim the compound flexible pipe, constructed substantially as described.

4th, I also claim the muffler, D, for the purpose of deadening the sound of the escaping air as described.

72,083.—MACHINE FOR SHARPENING SAWS.—E. B. Rich, (assignor to himself and Andre Cushing), Boston, Mass.

I claim the sliding holder, B, and adjustable rail, C, in combination with the grinding wheel, D, constructed and arranged to operate as herein described, for the purpose specified.

72,084.—AUTOMATIC REGISTER.—J. T. Buckley, Ottawa, Ill. administrator of the estate of Stephen Rigler, deceased.

I claim 1st, Operating a register slide so as to regulate the temperature of apartments, by means of a column of mercury within a tube, which is arranged within the register itself and acts upon said slide through the means substantially as described.

2d, The combination of an index hand, S, with a register arranged and operated by a column of mercury within a tube, which is arranged within the register itself, substantially as described.

3d, The combination with a circular turning register slide, B, of mercury pipe, G' piston rod, g1, cross-head, g, toothed lever, F, spur wheel, d and shaft, b, arranged, constructed and operating substantially as described.

72,085.—SHOVEL PLOW, CULTIVATOR, ETC.—P. A. Ross, Harveys, Pa.

I claim 1st, The combination of the notched rack, E, and removable pin, F, with the pivoted or rocking cross-bar, C, and slotted standard, D, substantially as herein shown and described and for the purpose set forth.

2d, Connecting the forward ends of the handles, D, to the beam, A, by means of the hook or eye-bolts, G, and pivoted bar or plate, H, when used in connection with the pivoted or rocking cross-bar, C, and pin, F, substantially as herein shown and described and for the purpose set forth.

72,086.—FENCE POST.—Robert Ramsey, New Wilmington, Pa.

I claim the fence-post, P P' P'', having dove-tail gains at its lower end, in combination with the parallel sills, A A', and the keys, e e e e, substantially in the manner and for the purpose set forth.

72,087.—CHURN.—J. A. Rowley, Vanceburg, Ky.

I claim the arrangement substantially as described of the driving wheel, C, shafts, c c', spring, D, notched bracket, E e, and friction pulley, F G, for the purpose of imparting a rotary motion to the dasher shaft, f, in the manner herein described and set forth.

72,088.—STEAM TRAP.—David Saunders, Brooklyn, N. Y. assignor to Jos. Nason & Co., New York city

Relaim 1st, The arrangement of the central part, C, of the cover and main cover, B, substantially as herein set forth.

2d, The arrangement of the stop-joint between the floating part and the fixed part of the apparatus, whereby to avoid the clogging by accumulations of dirt as specified.

3d, The arrangement of the tubes, E and H, the tube, H, being mounted upon the floating part, substantially as herein specified.

72,089.—DOOR SPRING.—Rudolph Schrader, Indianapolis, Ind.

I claim 1st, The door-spring, constructed as described, consisting of the hollow socket, F, placed over the square shank of the door arm; and provided with the right angular arm, J, sleeve, E, to which the inner end of the coiled spring, D, is securely fastened, fitting at or alternating upon the socket, F, and provided with the right angular arm, I, resting against the post, H, in the case, A, the free end, G, of the spring resting against the opposite side of said post, all operating as described for the purpose specified.

2d, The spring, D, operated by means of the right angular arm, J, of the hollow shank, F, engaging with the outer end, G, of the spring, when the door moves in one direction, and when moving in the opposite direction engaging with the arm, I, of the sleeve, E, to which the inner end of the spring is secured substantially as described for the purpose specified.

3d, The combination and arrangement within the case, A, of the spring, D, hollow socket, F, having arm, J, sleeve, E, having arm, I, post, H, and hook, G, operating as described for the purpose specified.

72,090.—POLE COUPLING FOR VEHICLES.—Anson Searls, N. Y. city.

I claim the circular joints, B B, and the arrangement of the ratchet teeth, K K, springs, D D, and bolts, E E, in combination with the arm, A, substantially as described and for the purposes set forth.

72,091.—CARRIAGE.—Anson Searls, San Francisco, Cal.

I claim, 1st, The axle composed of the steel bars, d and g, attached, as herein described.

2d, The clip b, passing around under the axle, with its ends fastened to the plate, a, on the rocker, both before and behind the axle, substantially as described.

72,092.—STEAM ENGINE.—George Shale, Taunton, Mass.

I claim, 1st, The steam-chest, B, constructed with the chambers, g h, and partition, p, in combination with the steam and exhaust pipes, and cylinder, a, substantially as described.

2d, The valve-rods, l l', provided with the recesses or chambers, k k', in combination with the partition, p, constructed as described, and operated by the lever, I, as and for the purpose set forth.

72,093.—FERRULE.—Archibald Shaw, Philadelphia, Pa.

I claim a ferrule, provided internally, or at its inner side, with oblique spurs or projections, substantially as and for the purpose specified.

72,094.—FENCE POST.—Warren H. Shay, Sylvania, Ohio.

I claim the plank standards, B B, joined by the pins, a a, the braces, A A, and the cross-piece, C, combined and secured by the dove-tail tenons, b b, the gib and key, c d, and the keys, g g, substantially as and for the purpose herein shown and described.

72,095.—TUBULAR HEATER.—C. J. Shepard, Brooklyn, N. Y.

I claim, 1st, The combination of the grate, E, ash-pit, D, and combustion-chamber, C, with the slide-valve, I, for the purposes indicated.

2d, The slide-valve at the junction of the upper and under front flue, for the purposes described.

3d, The upper front flue covered externally with a non-conducting lining, as a portion of the combustion-chamber.

4th, The corrugated tubular externally-flanged chamber, provided with an incombustible termination, constructed and operating substantially as shown, for the purposes pointed out.

5th, A semi-cylindrical reverberating chamber of combustion, when combined with a flue and a series of tubes, for the purposes specified.

6th, A feeding-chamber in combination with an arched chamber of combustion and the abutments for properly distributing the fuel upon the grate.

7th, Constructing the bed-plate or grate-plate in such a manner that the same shall form a support for the grate and brick-work of the chamber of combustion, as well as the bed of the front flue.

8th, The division-plate, in combination with a series of tubes, for the purposes fully described.

72,096.—WINDOW-SASH SUPPORTER.—J. W. Simpson, Newark, N. J.

I claim the lever, d, and wedge, b, constructed, combined, and operated substantially in the manner and for the purpose hereinabove set forth.

Also, the socket, m, with its ratch, n, and the catch, l, on the lever, d, in combination with the lever and wedge, in the manner and for the purpose specified.

72,097.—STAKE-HOLDER FOR RAILROAD CARS.—Thomas A. Slack, Peoria county, Ill.

I claim the combination of revolving staple, stakes, and divisional "coal sides," as described and for the purpose set forth.

72,098.—EXCAVATOR.—Benjamin Slusser, Sidney, Ohio, assignor to himself and Elias M. Gluck, same place.

I claim, 1st, The method of elevating or adjusting the plough of an excavator by the rotary motion of the forward axle, derived from the forward wheels by means of the clutches, a' a', substantially as and for the purposes set forth.

2d, In combination with the above, the plough, P, racks, r r, and pinion, s, when the latter is fixed to the axle, and operates to raise the plough by power derived from the axle, substantially as and for the purpose specified.

3d, The combination of the rocking cart, C, gear, e e' e'', apron, B, and plough, P, when the parts are so constructed and arranged that by the raising or depressing of the plough, the wheels, e e', shall be thrown into or out of gear, and the apron put in motion or stopped, substantially as and for the purpose specified.

4th, The combination of the looped rods, w w w, with the arms, v v v, doors, m m' m'', and lever, l'', substantially as and for the purpose specified.

5th, The lips or projections, o o, of the doors, m m' m'', substantially as and for the purposes set forth.

6th, The combination of the rod, u, lever, l', spring, s, trigger, n, doors, m m' m'', having the lips, o o o, rod, y', and hook, y, substantially as and for the purposes specified.

72,099.—AUGER HANDLE.—Daniel Y. Smith, Joliet, Ill.

I claim the combination of the ferrule, a, with the annular nut, e, and flat spring, c, when constructed and arranged as and for the purposes set forth.

72,100.—MACHINE FOR SHARPENING SAWS.—J. B. Smith, Milwaukee, Wis.

I claim cutter, B, gauge, E, and adjustable cone-mandrel, D, in combination, substantially as and for the purpose described.

72,101.—RAISING OILS AND BURNING-FLUIDS BY PNEUMATIC PRESSURE.—John Henry Smith, Allegheny city, Pa.

I claim raising, by pneumatic pressure, oils or burning-fluids from an oil or fluid compartment of a ship or other vessel, and mixing with said oil and fluid the gas generated therefrom, as herein described and set forth.

Also, the combination and arrangement of the pipes, A B C f and f', when used in connection with an oil or fluid compartment, R, of a ship or other vessel, the whole being constructed, arranged, and operating substantially in the manner herein described and for the purpose set forth.

Also, in connection with the above, ejecting fine jets of water into the flame, caused by the burning of the oil or fluid and other matter mixed therewith, as herein described and set forth.

72,102.—SHIP FOR TRANSPORTING PETROLEUM.—John H. Smith, Allegheny city, Pa.

I claim, providing the hulls of ships and other vessels with a compartment for oils and burning fluids, said compartment being protected with water, and furnished with supply and discharge pipes, substantially as herein described and for the purpose set forth.

72,103.—DEVICE FOR SHEARING AND CLIPPING WOOL.—R. T. Smith and J. K. Priest, Nashua, N. H.

I claim, 1st, The revolving spring cutter or cutters, O, in connection with a cutter-plate.

2d, The open cutter-plate, P.

3d, The shield, N, in connection with the cylinder, C, covering shaft, M, and extending into groove, g, substantially in the manner and for the purpose herein described.

72,104 —CORN PLOUGH.—John Snyder, Williamsfield, Ohio.

I claim the combination of the tongue, H, strap, L, and upright, K, with the forward end of the central beam, A, substantially as herein shown and described, and for the purpose set forth.

72,105.—BOOT-HEEL POLISHER.—V. K. Spear, Lynn, Mass.

I claim, 1st, The reciprocating polisher, moving in the line of an arc of a circle, by means of mechanism substantially as herein described, and having an elastic bearing, as and for the purpose set forth.

2d, In combination with a reciprocating polisher, substantially as described, I claim the pivoted sliding frame to support the boot or shoe, constructed, arranged, and operating substantially as set forth.

72,106.—MEANS FOR PROPELLING VESSELS.—Robt. R. Spedden and Daniel F. Stafford, Astoria, Oregon.

We claim, 1st, The combination of the rack-frame, K, racks, I and J, and ratchet-wheel, H, with each other and with a shaft, D, for the purpose of applying power to said shaft, substantially as herein shown and described.

2d, The combination of the stationary post, O, pitman, N, rocking-post, M, and adjusting slide, L, with each other, with the rack frame, K, and with the hinged parts of a vessel or other structure, one or both of said hinged parts floating in the water, so as to be acted upon by the motion of the waves, substantially as herein shown and described.

72,107.—CULTIVATOR.—C. E. Steller, Chicago, Ill.

I claim, 1st, The hinged runners, J W, substantially as and for the purpose set forth.

2d, The slotted sides, A A and B B, in combination with the shanks, C D E, arranged to be set at different angles, and fastened by set-screws, Z Z, as described.

3d, The combination of the guide-bar, E, arranged to be raised and lowered, with rear standards, H H, and sides, A A B B, as described.

4th, The combination of standards, G G, hinged runners, J W, and sides, A A B B, as set forth.

5th, The shanks, C, of shovel, T, arranged to fit in a socket, V, and bar, S, in combination with standards, G G, and cross-bar, I, as and for the purpose set forth.

6th, The double evener, L, arranged substantially as set forth.

7th, The double evener, L, in combination with braces, O O and P P, with or without braces, Y, substantially as set forth.

72,108.—EYE CUP.—Benj. F. Stephens, Brooklyn, N. Y.

I claim a pair of bowls, united by tubes or necks to an exhaustion-bag or ball, as and for the purposes set forth.

72,109.—HARVESTER RAKE.—Edward Stewart, Fort Madison, Iowa.

I claim the arrangement of the shafts, D E and G, with their respective wheels, crank, I, and pitman, J, with its dividing end, J', connecting the arms, c c, upon the box, K', at the end of shaft, K, the whole constructed and operating substantially as and for the purposes specified.

72,110.—STREET PAVEMENT.—H. M. Stow, San Francisco, Cal.

I claim, 1st, A wooden pavement, composed of alternate tiers of square-ended and wedge-shaped blocks, the wedge-shaped ends of the latter being driven down into a foundation-bed of sand or earth, substantially as and for the purpose described.

2d, A wooden pavement, composed of blocks with lower ends wedge-formed, and all driven down into a foundation-bed of sand or earth, substantially as shown and described.

73,111.—STREET PAVEMENT.—H. M. Stow, San Francisco, Cal

I claim, 1st, The cast iron plates, with projecting wedge-shaped flanges, to be driven into the sand or earth, substantially as and for the purpose set forth.
2d, Also a pavement composed of alternate tiers of cast iron plates, with projecting wedge-shaped flanges and wedge-shaped wooden blocks, driven into the sand and earth, substantially as described.

72,112.—WASHING MACHINE.—John D. Swartz, Milton, Pa.
I claim, 1st, The slotted arms, g, bearing the shaft, D, and rubber, C, when such arms are connected at their lower ends by the slotted bar, E, through which the spring, G, passes, as herein described for the purpose specified.
2d, The combination of the semi-circular rubber, C, slotted arms, g, shaft, D, slotted cross-bar, E, spirally grooved rollers, d, in the curved frames, B, the spring, G, and rack, H, as herein described for the purpose specified.

72,113.—PORTABLE FENCE.—G. D. Sweigert, Martic township, Pa., assignor to himself, John Sweigert and Felix W. Sweigert.
I claim a portable fence, combined of round wrought-iron posts, C, bed-plate, A, rails, B, scarfed, and applied with intervening ferrules, D, head and bottom washers, F, all arranged in the manner and for the purpose specified.

72,114.—VARIABLE CRANK FOR BORING-MACHINE.—G. C. Taft, Worcester, Mass., assignor to Theodore Mase, Sing Sing, N. Y.
I claim the two variable cranks, constructed as specified, and applied in the manner shown, to the shaft or axis of the boring-machine, as and for the purposes set forth.

72,115.—ROTARY TAKE-UP FOR KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, The stationary scroll-plate, C, placed over the center of motion of take-up of knitting machines, for the purpose described.
2d, Also, in combination with the scroll-plate, C, the toothed gear, D, for the purpose herein set forth.
3d, Also, the toothed wheel, D, or its equivalent, either separately, or combined with the described appendages, e i g i K, arranged as shown and described as operating substantially in the manner and for the purpose specified.
4th, Also, in combination with the above, the adjustable gear, s, and concentric gears, s', for the purpose described.

72,116.—KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, Forming the "jacks" or loop-lifters, B, with a projecting arc, f, and depressed arc, g, for the purposes set forth.
2d, In combination with the arc, f, and arch, g, the rounded end, as shown and described.
3d, In combination with the described knitting jacks, a retaining hub or device, constructed and arranged as shown and described.

72,117.—KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, The vertically adjustable collars or rings, G and H, for the purposes described.
2d, In combination with the collars, G and H, the partitions or wings, k, and groove, l, as set forth.
3d, In combination with the adjustable collars, G and H, wings, k, and groove, l, the "jacks" or lifters, M, formed as shown and described, for the purpose specified.

72,118.—MANUFACTURING ILLUMINATING GAS.—J. B. Terry, Hartford, Conn.
I claim, 1st, The method herein described of heating air charged with hydrocarbon vapor, so as to render it non condensable previous to its delivery as an illuminating gas, for the purposes set forth.
2d, The employment of a retort or other heating medium interposed between the carbureter and gas holder or other gas-delivering or gas-burning device, substantially as and for the purposes set forth.
3d, The employment of one or more burners under the retort or vessel, for the purpose of heating the same under the arrangement herein shown and described.
4th, The combination, with the carbureting-vessel and intermediate heater, of a jacket under or around the said carbureter, and a flue connecting the jacket with said heater, substantially in the manner and for the purposes set forth.

72,119.—LOOMS.—S. T. Thomas and J. H. Dolley, Guildford, N. H.
We claim, in combination with the lever, g, arranged to operate as set forth, the incline, n, or its equivalent, for relieving the picker from the action of the spring, i, to permit free movement of the shuttle-boxes, substantially as set forth.

72,120.—GATE.—John W. Thompson, Greenfield, Mass.
I claim a gate, made of metallic tubing and connections, substantially as herein set forth and described.

72,121.—TAIL-PIECE FOR VIOLINS.—James Thoms, South Boston, Mass.
I claim applying a winch to the tail-piece of a violin, substantially as and for the purpose herein shown and described.

72,122.—FOLDING BEDSTEAD AND CRIB.—R. S. Titcomb, Gloversville, N. Y.
I claim, 1st, A folding bedstead or crib, substantially as shown and described, and for the purpose set forth.
2d, A rotating bedding-box, A, in combination with the head and foot-boards of a bedstead or crib, substantially as shown and described, and for the purposes set forth.
3d, Folding head and foot-boards, composed of the parts, F and C, substantially as shown and described, and for the purposes set forth.
4th, The swinging sides, A', in combination with the box, A, and the head and foot-boards, F C, substantially as shown and described, and for the purposes set forth.

72,123.—STEAM ENGINE.—J. F. Troxel, Bloomsville, Ohio.
I claim, 1st, The construction of the oscillating valve, T, and arrangement of the openings, S P P', and R, substantially as shown and described.
2d, Also, the arrangement of the piston rods, K and L, operating in one and the same end of the cylinder, substantially as shown and described.

72,124.—WARDROBE.—Nathan Turner, West Lynn, Mass.
I claim a convertible wardrobe, closet, or book case, with swinging or folding sides, C, and swinging or folding top, A, and bottom, B, substantially as described and for the purpose set forth.

72,125.—APPARATUS FOR DISTILLING OILS.—Herbert W. C. Tweddle, Pittsburg, Pa
I claim, 1st, A trough or troughs, having perforations for the passage of the oil in small quantities, and furnished with points near to such perforations, so as to cause the oil to pass therefrom in drops, or fine streams, or thin films or layers, over heated pipes or tubes placed thereunder, when used within a vacuum still, for the purposes substantially as described.
2d, In a vacuum still for distilling oil, the use of a series or coil of steam pipe, placed horizontally, one under another, as a series of evaporating surfaces, substantially as and for the purposes above set forth.
3d, In a vacuum still for distilling oil, a series or coil of steam jet pipes, e, in combination with a series or coil of evaporating pipes, a, substantially as and for the purposes above set forth.
4th, Combining together a series of apparatus, such as hereinbefore described, for the purpose of procuring a continuous distillation of petroleum, each member of a series consisting of a vacuum still containing a coil of steam pipe as evaporating surfaces, and troughs for the gradual distillation of the oil, in combination with suitable condensing apparatus, substantially as and for the purposes hereinbefore set forth.
5th, A vacuum residuum receiver, D, connected to and in combination with a vacuum still, or a battery of such stills, substantially in the manner and for the purposes above set forth.

72,126.—DISTILLING HYDROCARBON OILS.—Herbert W. C. Tweddle, Pittsburg, Pa.
I claim, 1st, In distilling hydrocarbon oils, vaporizing the oil by causing it to flow in a thin film or layer over the surfaces of a series of heated pipes in a vacuum still, with or without the application of superheated steam, substantially as above described.
2d, The application of the process of distillation, hereinbefore described, to the re-distillation of fire-distilled oils, for the purpose of producing an oil similar to the refined oil of commerce, substantially as above set forth.
3d, Securing a continuous and complete distillation of hydrocarbon oils, by causing the oil to flow over the surfaces of a succession of heated pipes in different vacuum stills, the temperature of such pipes increasing in each successive still, so as to drive off at first more volatile ingredients, and then those less so, and so on till only the residuum remains, substantially as hereinbefore described.

72,127.—GRAIN DRILL.—Joseph G. Vale, Cumberland Co., Pa.
I claim the quarti-elliptical shovel, B, with its base, E E', coming to a point at E, the rod, C, the rod, H, with thereon the balls, D and D', together with the funnel, A, all constructed and operating in the manner and for the purpose described.

72,128.—WINDOW-SASH STOP.—George R. Vanderbilt (assignor to himself, J. J. Lindstrom, and D. W. Stidolph), Mount Vernon, N. Y.
I claim, 1st, The two clamping plates, and the tightening bolt, combined and operated substantially as and for the purpose specified.
2d, The springs, arranged in relation to the plates, c d, substantially as and for the purpose specified.

72,129.—MUSICAL INSTRUMENTS.—George W. Van Dusen, Williamsburg, N. Y.
I claim the combination and arrangement of lever, V, with finger-piece, Y, at one end, and stud, b, at the other, valve, G, and air passage, E, closed by a flexible diaphragm, K, substantially as herein described, and for the purpose of producing, by means of air, an action upon any suitable sound-producing mechanism through the movement of a sheet or strip perforated, or in any other equivalent manner prepared.

72,130.—WATER INDICATOR FOR BOILERS.—Andreas Vang, Chicago, Ill.
I claim the arrangement of the globe, a, arm, b, cylinder, c, indicator, f, and whistle, g, substantially as herein set forth.

72,131.—HORSE HAY FORK.—Oliver Vanorman, Ripon, Wis.
I claim the arrangement of the fork heads, B B', in the frame, A, and with the arms, C C', rollers, e e, and cords, D D, as and for the purpose set forth.

72,132.—WASHING MACHINE.—Lewis Vaughan, Rapids, O.
I claim the adjustable bottom, B, and spring lever, I, as arranged in combination with the roller, C, in the manner substantially as described.

72,133.—HAY RAKER AND LOADER.—Albert Vose, Pittsfield, assignor to himself and Ambrose S. Vose, Randolph, Vt.
I claim, 1st, The fork arm, b, hinged or pivoted to the frame in line with the axle, and operated by means of friction blocks, as described.
2d, The friction blocks, d, in combination with fork arm, b, and eccentric levers, e, arranged as described.
3d, The fork arms, b, in combination with the freely-swiveling fork bar, o, operated as described.
4th, The forks, q, pivoted in swiveling bar, o, and operated by means of levers, v, and rods, cords, or chains, substantially as described.
5th, The levers, v, mounted on fork bars or arms, b, in combination with the fork, q, substantially as described.
6th, The combination of forks, q, spring, t, chains, w, and levers, v, with the fork arm, b, substantially as and for the purpose set forth.
7th, The means for opening and closing the lifting forks, in combination with a means for operating the friction blocks, or their equivalent, whereby they are operated simultaneously, as described.
8th, The lever, e, for closing the forks and applying the friction blocks, as described, in combition with the arms, g, for releasing the same as described.
9th, The extension, x, of the pivoted fork bars, b, in combination with cords or chains, 5, operating as described
10th, The curved or semicircular rake head, or its equivalent, arranged in rear of and operated in connection with the lifting fork, substantially as described.

72,134.—WASHING MACHINE.—George E. Wade, Jefferson City, Mo.
I claim the lever, M, the spiral metal plate, F, the wash boards, A and B, corrugated as shown, and the springs, c c' c'', in combination with a common wash tub, when constructed, arranged, and operating substantially as shown and specified.

72,135.—BOLT AND RIVET MACHINE.—John Wakefield, Birmingham, England, assignor to Isaac Smith and William Fothergill Barbo.
I claim, 1st, the arrangement or combination, substantially as hereinbefore described, and illustrated in the accompanying drawings, of the vertical dies, b b, for cutting off and carrying the cut-off length of rod, and for shaping the head of the rivet or bolt, with the horizontal punch or die, m, for shaping the shank of the rivet or bolt, and upsetting the end of the rivet or bolt into a head in the vertical dies.
2d, The arrangement or combination of parts hereinbefore described, and illustrated in the accompanying drawings, for giving motion to the said vertical dies, b b, and horizontal punch or die, m.
3d, The arrangement or combination of parts hereinbefore described and illustrated in the accompanying drawings, for removing the finished rivet or bolt from the horizontal punch or die.

72,136.—EGG BEATER.—Dudley Webster, Washington, D. C.
I claim as a new article of manufacture an egg-beater spoon, constructed as described, viz., with its circumference and the edges of an inner central opening serrated as and for the purpose described.

72,137.—BRICK MACHINE.—P. V. Westfall, Kalamazoo, Mich.
I claim, 1st, the combination of the two molding cylinders, C C, when the molding recesses, I I, in said cylinders, and their intermediate followers, J J, are so proportioned with each other that the faces of the said followers cannot be brought in contact with each other, and when the said follower pieces have substantially the degree of curvature herein represented and described.
2d, In connection with the molding cylinders, C C, I also claim the central shaft, b, and its operating levers, L L, in combination with the jointed rods, n n, and the crank arms, m m, on the respective cam shafts, for operating all the cams simultaneously, substantially in the manner herein set forth.
3d, Also the vibrating spring scraper, i, in combination with the wire cloth belt, w, when arranged with the molding cylinders, C C, and operated substantially in the manner and for the purpose herein set forth.

72,138.—APPARATUS FOR ENAMELING PHOTOGRAPHIC PICTURES.—Nathaniel Weston, San Francisco, Cal.
I claim the rest, A, for the glass, or its equivalent, the use of the glasses, B B, the weight G, the fastenings, H, the clamps, E E, or their equivalents, in combination, for the purposes herein set forth.

72,139.—VALVE GEAR FOR STEAM ENGINES.—Norman W. Wheeler, Brooklyn, N. Y.
I claim, 1st, Opening the ports, as l' l'' so as to suspend the operation of the moving force upon the valve or valves at the period when the steam is cut off, and before the exhaust is opened, substantially as and for the purpose herein set forth.
2d, Also the closure of certain ports, as l' l'' and k' k'', so as to cause the valve or valves to resume the movement toward its or their full throw at the proper period, substantially as and for the purposes herein set forth.
3d, Also opening the proper ports, as h' h'', so as to suspend the moving force operating upon the valve or valves, when they or it have reached the proper limit of throw, substantially as and for the purposes herein set forth.
4th, Also regulating the times of closing passages, so as to induce the cutting-off movement of the valve or valves, at variable periods, substantially in the manner and for the purposes herein set forth.
5th, Also changing a continuous reciprocating motion derived from an eccentric, or equivalent moving part of the engine, to an intermittent reciprocating motion, by means of a hydraulic apparatus, as hereinbefore described, substantially in the manner and for the purpose herein set forth.

72,140.—DITCHING MACHINE.—A. H. Whitacre and T. S. Whitacre, Morrow, Ohio.
We claim, 1st, The combination of the sled, A, and the frame, B, connected by the racks and pinions, c a, at the corners, arranged and operating substantially as and for the purpose described.
2d, The pulleys, D and E, carrying the endles chain, g, with the scoops, h h, in combination with the drum, C, the plungers, n n, operating by the double incline, p, around the wheel, K, and the sweep, F, constructed and operating substantially as and for the purpose herein described.

72,141.—FARM FENCE.—Samuel P. Williams, Sheridan, N. Y.
I claim the application and use of the triangular brace posts, B B, and tie-rod, C, in the construction of farm fences, in the manner substantially as described.

72,142.—VENTILATING TUNNEL.—Hugh B. Wilson, N. Y. city.
I claim, 1st, The method of applying street lamp posts, and awning and other useful or ornamental posts, pillars, or structures, to the purposes of ventilating underground railway tunnels, substantially as within described.
2d, Also the combination of street lamp posts, and awning and other posts, pillars, or structures, whether for ornament or use, with the connecting tubes of such railway tunnels, substantially in manner set forth.

72,143.—MEDICAL COMPOUND.—J. T. Wilson, Brooklyn, N. Y.
I claim the combination of the above-named ingredients in the manner as and for the purpose described.

72,144.—SHOE LIFTER.—Wm. H. Winans, Newark, N. J.
I claim, 1st, The combination of the lever plate, A, griping plate, B, spring, b, and holding lever, C, substantially as and for the purpose specified.
2d, The teeth or studs, a', provided upon the inner surface of the griping plate B, and arranged in relation with the back of the plate, A, substantially as and for the purpose specified.

72,145.—STOVE.—T. W. Wisner, Howell, Mich.
I claim the portable bop-drying stove, constructed as described, of the corrugated side and end plates, A, supported upon the ash pan, B, extending the entire length of the stove, and mounted upon wheels, the adjustable grate placed at b, in the center of the stove, and the boiler, all arranged as described for the purpose specified.

72,146.—PAPER FILE.—John Wolfe, Washington, D. C.
I claim the paper file or holder constructed and operated as herein recited.

72,147.—LATHE BOX AND JOURNAL.—Aurin Wood, Worcester, Mass.
I claim, 1st, The combination and relative arrangement of the oil box, B, and grove, a, and inclined oil passage, e, formed in the bottom part, A, of the journal box, substantially in the manner and for the purposes herein shown and specified.
The combination of the journal, C, having the peculiarly shaped grooves, d d, cut in its surface, with the journal box, D, provided in its lower part with the oil box, inclined oil passage, and groove, a, under the arrangement substantially as herein shown and set forth.

72,148.—LATHE FOR TURNING SHAFTING.—Aurin Wood, Worcester, Mass.
I claim, 1st, The combination with the bed of the lathe, provided with a reservoir or receptacle, as described, of the sliding tool carriage and the pump, attached to and moving with said carriage, substantially as and for the purposes shown and set forth.
2d, The combination with the sliding tool carriage and pump, mounted upon said carriage, of the cup, C, and tube connecting said cup with the pump, substantially in the manner and for the purposes herein shown and described.
3d, The method of operating the pump by connecting the piston rod of the same with a friction wheel, actuated by the rotation of the shaft which is being turned in the machine, in the manner herein shown and specified.

72,149.—FINGER BAR FOR HARVESTER.—Walter A. Wood, Hoosick Falls, N. Y.
I claim, bevelling off the front upper corner of the finger bar, to afford a seat for the sickle or scythe bar, to vibrate upon, in combination with bevelling off the lower side of the finger bar, for the reception of the guard finger.

72,150.—CURTAIN FIXTURE.—William H. Woods, Philadelphia, Pa.
I claim the lever dog, e, with the cross foot, c, engaging and disengaging the teeth of the rack, b b, in combination with the swivelled knob, d, having a cross bar, g, and working in the slot, a a, of the racket case, A, substantially as and for the purpose herein described.

72,151.—CHIMNEY.—Ebenezer S. Phelps, Jr., Wyanet, Ill.
I claim the device above described, consisting of the iron box, A, and drawer, B, constructed and arranged as shown, when used in combination with the chimney, D, substantially in the manner and for the purposes specified.

REISSUES.

62,057.—BRICK MACHINE.—Philip H. Kells, Adrian, Mich. Dated March 19, 1867. Reissue 2,810.
I claim, 1st, The combination of the annular mold bed, B, and the central hub or support, C, substantially as described and represented.
2d, The adjustable wedge-shaped cut off, d, arranged and employed in the manner and for the purpose explained.
3d, The arrangement upon the mold wheel of the two pug mills on opposite portions, substantially as described.
4th, An annular mold wheel, provided with cogs or gear teeth upon its periphery, and mounted upon a central hub or support, substantially as and for the purpose set forth.

DESIGNS.

2,846.—MASONIC BADGE.—Virgil Price, New York city.
2,847.—COOK'S STOVE.—Russell Wheeler, Utica, N. Y.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

40,571.—ROTARY ENGINE.—Metropolitan Rotary Engine Co. (assignees by mesne assignments of Adolph Mildechan), New York city. Dated Nov. 10, 1863. Application for reissue received and filed Sept. 27, 1867.
1st, The combination with the outer stationary case, d, and its concentric inner cylinder or flanges, x, of the eccentric wheel, ring or rim, c, fast to the rotating shaft and carrying radial slides or pistons for simultaneous action and exposure to the steam or fluid in chambers, y and z, on opposite sides or peripheries of the ring, c, essentially as herein set forth.
2d, The pipes, l l n and o, and valves or cocks k k' m' and m', in combination with the ring, c, and pistons acting in the steam spaces, y and z, substantially as specified.

2,821 (whole No. 33,825).—LAMP.—Charles W. Cahoon, Portland, Me. Dated Dec. 3, 1861. Application for reissue received and filed Nov. 22, 1867.
1st, A lever with chimney fastenings having that part of it on which the chimney rests extended so as to form a deflector, substantially as described.
2d, The deflector board or flat shaped or nearly so when made not only as a deflector but partly as a chimney holder, substantially as described.
3d, The combination of the said deflector with the conical foraminous piece of metal and the cylindrical tubular air screen for the purpose of forming the air chamber, A, protecting the flame and admitting the air from below the same, substantially as described.
4th, The combination with the lever for raising the chimney of the deflector, air screen and foraminous piece of metal, substantially as and for the purposes specified.
5th, The ring surrounding the wick tube a little above the top of the same with the standards, s s, substantially as and for the purposes specified.
6th, A chimney holder having a projection for manipulating the same, chimney fastenings, a deflector and a joint, substantially as and for the purposes set forth.
7th, The combination of the ring, f, supports, s s, and air screen, c, substantially as and for the purpose set forth.
8th, The combination of the glass body of a lamp with a metallic handle, substantially as and for the purpose set forth.

61,956.—COOKING STOVE.—J. J. Savage, Troy, N. Y. Dated Feb. 12, 1867. Application for reissue received and filed Dec. 4, 1867.
1st, I claim constructing a heating stove with its fuel door way or aperture, B, below and forward of its flame or combustion chamber and contiguous to or adjoining its fire box, A, in manner substantially as and for the purposes herein set forth.
2d, I claim the combination of the fuel door way or aperture, B, and the fire box, A, extended contiguously thereunder as applied to heating stoves, in manner substantially as and for the purposes set forth.
3d, I claim, in combination with a heating stove having its fuel door way in the position as herein described, the employment therewith of a lifting lever, F, substantially in manner as and for the purposes herein set forth.
4th, I claim, in a heating stove, in combination with a fire box, back lining plates and its fuel door way or aperture, B, the arrangement of a front lining plate, E, in position between the flame chamber, C, and the said fuel aperture, in manner substantially as and for the purpose set forth.
5th, in combination with a lever lifter, F, applied to heating stoves in manner as herein described, I claim the employment of a holding hook, b, and catch ridge, c, substantially as and for the purpose set forth.
6th, I claim so constructing a heating stove in manner substantially as described herein that fresh fuel may be cast directly into its fire box below and between ignited fuel or coke therein, in manner substantially as herein set forth for the purposes specified.

16,944.—GUN POWDER KEG.—Henry E. Irenee L. and Eugene Du Pont (assignees of James Wilson and William Wilson, J. and Charles Green for themselves) Wilmington, Del. Dated March 31, 1857. Application for reissue received and filed Nov. 30, 1867.
1st, As a new article of manufacture a keg or can with a series of corrugations representing hoops which give combined strength and finish.
2d, Casting the female screw for the stopper on a tap or mandrel, as set forth.
3d, The extra ring or boss, D, and head, C, as set forth.

62,693.—MACHINE FOR CUTTING THREADS ON BOLTS.—Schweitzer Patent Bolt Co. (assignees of Franzis Schweitzer), New York city. Dated March 5, 1867. Application for reissue received and filed Nov. 30, 1867.
1st, The sliding or movable heads, N O, in combination with the lever, P, and cutter or dies, a b, substantially as and for the purpose described.
2d, The adjustable lever, P, provided with arms, d e, substantially as and for the purpose set forth.
3d, The elastic rest, g, constructed and operating substantially as and for the purpose shown and described.

52,169.—MARKING WHEEL.—Horace Holt, New York city. Dated Jan. 23, 1866. Application for reissue received and filed Nov. 30, 1867.
1st, The combination of the type wheel, A, inking roller, C, and handle, B, substantially as and for the purpose described.
2d, The ink reservoir, c, in combination with the roller, C, type wheel, A and handle, B, substantially as and for the purpose set forth.
3d, The projecting flanges, b, on the type wheel, A, constructed and operating substantially as and for the purpose described.
4th, The stop, h, in combination with the type wheel, A, and handle, B, substantially as and for the purpose set forth.
5th, The spring, g, in combination with the stop, h, type wheel, A, and handle, B, substantially as and for the purpose described.

18,872.—BORING MACHINE.—A. Wyckoff (assignee by mesne assignments of La Fayette Stevens), Elmira, N. Y. Dated Dec. 15, 1857. Application for reissue received and filed Nov. 29, 1867.
1st, The hollow cylindrical stock of an annular auger in combination with a spiral flange with such a pitch as will remove the cuttings horizontally as made and deliver them from the opening of the annular kerf, substantially as set forth.
2d, The combination of a hollow annular bit having their cutting lips projecting in the direction of the rotation of the bit, a hollow cylindrical stock and a spiral flange, substantially as described.
3d, An annular bit formed in one piece and used in combination with a hollow cylindrical stock for cutting an annular kerf in a stick of timber, substantially as set forth
4th, The loose independent collar, f, provided with knife edges, g g, to keep it from turning for the purpose of furnishing a bearing for the head of the auger while in operation.
5th, The sharp annular spur, c, for the purpose of centering and guiding the auger and at the same time leaving a core of the material bored in the center of the auger, in the manner specified.
6th, The oblique traversing rests, O O, in combination with the screws, t t, and dogs, Q, for the purpose of adjusting the timber to the auger as described and holding it firmly while under the operation of the auger.

66,608.—DREDGING MACHINE.—James H. McLean, St. Louis, Mo. Dated July 9, 1867. Application for reissue received and filed Nov. 8, 1867.
1st, The adjustable dredging frame, C, when such adjustment is produced by a derrick, l l, and fall, when constructed and operated substantially as shown and specified.
2d, The scoops, d, of a dredging machine having circular vertical cutting edges in advance of the usual lateral cutting edge, W, Fig. 1, when constructed and operating substantially as shown and specified.
3d, In combination with the dredging vessel the pins, L, for the purpose of moving the same, substantially as described.
4th, The dredger, the receiving and discharging apron and the derrick of a dredging machine all in combination, when constructed and operated substantially as shown and specified.

49,992.—SLEEPING CAR.—George M. Pullman, Chicago, Ill., assignee of Ben. Field, Albion, N. Y., and George M. Pullman, Chicago, Ill. Dated Sept. 19, 1865. Application for reissue received and filed Nov. 26, 1867.
1st, The berth, A, permanently connected with the side of the car by hinges, B, in combination with the recess to receive the same when turned up, substantially as described.
2d, The employment in combination with the berth, A, as described of jointed suspenders to support the inner side of the berth that will fold together to permit the berth to be turned up, substantially as described.
3d, The employment in combination with the berth, A, as described, of the sliding partition, I, substantially as described.
4th, The employment in combination with the berth, A, as described, of the movable head board, J, substantially as described.
5th, The employment in combination with the berth, A, as described, of a counterpoise to facilitate the handling of the same, substantially as described.
6th, Constructing a car seat with the back and seat cushions hinged together and disconnected from the seat frame so that the back cushion may be placed on the seat frame and the seat cushion extended to meet the seat cushion of the opposite chair, substantially as described.

48,555.—DOOR BOLT.—The Stanley Works (assignees of William H. Hart), New Britain, Conn. Dated July 4, 1865. Application for reissue received and filed Oct. 29, 1867.
1st, Making the barrel of a door or shutter bolt of sheet metal, substantially as shown and described.
2d, The bolt catch or keeper with the base plate formed with a flanch at right angles, substantially as described, that it may be secured by screws parallel with the axis of the bolt, substantially as described.

29,430.—INDEX DOOR PLATE.—E. M. Montague, Boston, Mass., assignee of Nathan Ames, Saugus Center, Mass. Dated July 31, 1860. Application for reissue received and filed Oct 15, 1866.
1st, The use in a door plate of a tablet or slate and an adjustable plate or disk having figures or readable signs or characters, for the purposes specified and set forth.
2d, In combination with the above door plate a rotating disk, C, marked with the hours and parts of an hour, as shown in Fig. 2, said disk being confined in the center to a spindle, D, which passes through the door, substantially as and for the purpose described.
3d, The spring, S, arranged, combined and operating substantially as described.

65,018.—STEAM GENERATOR GAGE LOCK.—Thomas Shaw, Philadelphia, Pa. Dated May 21, 1867. Application for reissue received and filed Oct. 11, 1867.
The construction and arrangement of whistle with gage valve whereby to indicate the sound produced by steam or steam and water commingled or water unmingled with steam, substantially as set foath.

49,847.—STEAM GENERATOR.—John R. Eckman, Green Post office, Pa., assignee of John D. Beers, Philadelphia, Pa. Dated Sept. 12, 1865. Application for reissue received and filed Sept. 30, 1867.
1st, Broadly the circular plate or ring, b, as shown and described.
2d, The plate, H, encircling the fire box, substantially as shown and described.
3d, Forming a water space between the inner surface of the boiler shell, A, and the plate or ring, b, as shown and described.

9,286.—MACHINERY FOR CUTTING LATHS FROM A REVOLVING LOG.—Jonathan C. Brown, Brooklyn, N. Y., assignee of Henry C. Smith, Cleveland, Ohio. Dated Sept. 28, 1852. Application for reissue received and filed Dec. 5, 1867.
1st, Turning the log to be cut by driving the mandrels at each end thereof by gearing them directly with the driving shaft, substantially as and for the purposes set forth.
2d, The dog, A, and its appurtenances for connecting the log with the mandrels and disconnecting it therefrom, as specified.
3d, The combination of the cylinder cutter, K, and the stripping knife moved up simultaneously and automatically, all substantially as and for the purposes set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Scientific American.

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VOL. XVII., No. 26....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, DECEMBER 28, 1867.

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THE LAST NUMBER OF VOLUME XVII.

We give in this number a full index of the volume of which this is the last issue. No doubt this will be more satisfactory to our readers—those at least who preserve their numbers for binding, and probably most do—than publishing the index in a separate sheet. The list of claims in this number will be found to be unusually full, a gratifying evidence that dullness of business does not cripple the resources nor abate the industry of our inventors. With a parting word of good will to our present subscribers and a welcome to those who begin with our new volume, we wish for all a HAPPY NEW YEAR.

COMMENCEMENT OF A NEW VOLUME.

With the next number the SCIENTIFIC AMERICAN enters upon its twenty-third year. Probably no publication extant will furnish a more complete and exhaustive exhibit of the progress of science and the arts in this country for the past twenty-two years than a complete file of the SCIENTIFIC AMERICAN. It is a curious and interesting pastime to compare the condition of the mechanic arts as presented in some of our first volumes with that shown in our more recent ones. During all this time, nearly a quarter of a century, our journal has endeavored to represent the actual condition of our scientific and mechanical progress and to record the discoveries and improvements in these departments wherever made. The result is a compendium of valuable information unattainable through any other means.

But the SCIENTIFIC AMERICAN has aimed not only to gratify a laudable curiosity by collecting and presenting such information, but to give practical knowledge which could be applied to valuable uses.

We labor for the producers—the mechanics, farmers, laborers—those who build up a country and make the wilderness to blossom like the rose. We believe that the workers are the power, especially in this country; and while we do not wish to detract from the value of the products of merely intellectual speculators, we still think that the world needs specially the laborer. We use the term "laborer" in this connection in its widest sense, comprehending he who uses brain as well as he who employs muscle; scientific investigation and discovery should be followed by and united to practical application.

The improvement exhibited in our past volumes will be no less noticeable hereafter. Keeping pace with the "march of mind" we shall endeavor always to lead rather than to follow. The different departments of our paper are managed by those who are practically acquainted with the subjects they profess to elucidate. "To err is human," but we shall spare no pains nor expense to make the SCIENTIFIC AMERICAN as reliable in its statements as it is interesting in the variety and matter of its subjects. There are none of our people, from the student or professional man to the day laborer, but will find something in every number, of present or future value to him in his business.

A CHANGE AT THE PATENT OFFICE.

T. C. Theaker has resigned as Commissioner of Patents. A number of gentlemen are mentioned as candidates for the succession, prominent among whom are B. T. James and Charles Mason. Mr. James has acted in the capacity of primary Examiner in the Engineering Class for a number of years, and has filled his position acceptably. Judge Mason held the Commissionership from 1853 to 1857, and his whole administration was marked with reform and ability. Judge Mason was educated at West Point, and he is a man of sterling integrity, a sound jurist, experienced in patent law, and a splendid executive officer. One thing may be relied upon, if Judge Mason should receive and accept the appointment of Commissioner, inventors will not have to complain long of delay in the examination of their cases. The Judge is as industrious by nature as he is stern and systematic by education and he will have no drones about him. The work of the office under his administration would be brought up and kept up.

A good day for inventors and all persons having business with the Patent Office will dawn when Judge Mason takes the Commissioner's chair again, and we hope the proper influences may be brought to bear to secure his acceptance.

OBITUARY.

EBENEZER WINSHIP, died at his home in this city Dec. 6, 1867, at the age of 67. A long and eminently useful although unobtrusive life entitles his memory to respect. He commenced his career as a mechanic in the steam engine establishment of James P. Allaire, soon after the application of steam for the propulsion of boats and long before its application to ships for the purposes of commerce or war. For fifty-two years, with the exception of one or two brief intervals, he was connected with the Allaire works in this city, and for more than forty years he was the master mechanic and general superintendent of the works. Probably no man now living has had a more intimate connection with the construction of the marine steam engine in all its remarkable changes and improvements, or been so long employed at one engine establishment.

James P. Allaire, the founder of the Allaire Works, died May 20, 1858, at the age of 73. He was an intimate acquaintance of Fulton and from the engine of Fulton's first boat, the *Clermont*, took drawings which he used in the construction of his first marine engines. He built the engines for the *Chancellor Livingston* which ran between New York and Albany. He built also the first marine engines ever constructed in this country, which were put into the steamship *Savannah*, the first steamer that crossed the Atlantic, and also those for the *Pacific* and *Baltic* of the Collins line, which ships surpassed in speed any before constructed.

Under such tutelage and with such advantages Mr. Winship rose successively through the grades of apprentice, journeyman, boss, and foreman, to the position of master mechanic and superintendent. Connected intimately with the progress of marine engineering for over half a century, he was the teacher of a large number of our engineers who now reflect credit upon their instructor. Mr. Winship's professional skill was unsurpassed; his ability in directing and managing others and thorough acquaintance with the minutest details made him invaluable in the position he so long honorably filled. His personal characteristics were faithfulness, industry, earnestness, kindness of heart, and unvarying punctuality and promptness. As master mechanic it was his invariable rule to be at the works an hour before the time for beginning labor to lay out the work for the hands, getting his breakfast in winter by gaslight and returning from dinner in time to see the condition of the work before the men arrived. In short, he made his employers' business his own and neglected nothing which might contribute to their success. He was a connecting link between the present generation of mechanics and that which saw the beginings of that great power, steam, which has revolutionized the world. His funeral on the 8th of December was attended by all the employés of the Allaire Works, by many from other mechanical establishments, and a large number of citizens.

How to Make Intelligent Workmen---Go and Do Likewise.

Mr. H. O. Osborn, of Castleton, Vt., in a letter covering an order for a club of subscribers, says:—"It may not be uninteresting to you to learn that the last six names are those of young men in my employ. I have myself been your subscriber for the past four years, and knowing as I did the value of your paper, I felt it a duty I owed to my men to recommend the paper to their notice, and the result is as above. I am proud to think that I have so many in my mill who can appreciate its worth. I hope at no remote date to send you another list of names from among my own men, and I am certain that if every manufacturer would consult his own best interest he would do all he could to place your paper in the hands of his workmen, for I feel it to be a valuable acquisition to all in any way connected with machines."

We believe that employers who wish to improve the condition of their employés can render them no better service than to make each of them a Christmas present of a year's subscription to this paper. Send in the names early, so that we may know how large an edition to print to supply the demand. We close this Volume with over 30,000—nearly 35,000—subscribers, and we wish to commence the new with at least 50,000. Send in your names.

The Iron-Clads at Sea.

In his last annual report to Congress, the Secretary of the Navy thus refers to the cruise of the *Miantonomah* to Europe and her return and of the *Monadnock* to San Francisco, voyages the most remarkable ever undertaken by turreted iron-clad vessels. These vessels encountered every variety of weather, and under all circumstances proved themselves to be staunch, reliable sea-going ships. The monitor type of vessel has been constructed primarily for harbor defence, and it was not contemplated that they would do more than move from port to port on our own coast. These voyages demonstrate their ability to go to any part of the world, and it is believed by experienced naval officers that with slight modifications above the water line, in no way interfering with their efficiency in action, they will safely make the longest and most difficult voyages without convoy.

Steam, turreted iron-clads and fifteen-inch guns have revolutionized naval warfare, and foreign governments, becoming sensible of this great change, are slowly but surely coming to the conclusion that turreted vessels and heavy ordnance are essential parts of an efficient fighting navy.

THE SCIENTIFIC AMERICAN AS A MEDIUM OF BUSINESS.

We seldom publish the favorable opinions expressed by our correspondents when in their letters they allude to this journal. If we chose we could fill columns with notices similar to those which follow.

R. S. Miller of Logansport, Ind., under date of Dec. 2d, says:—

I have a club of 10 or 12 engaged, and will send names and money about the 20th inst. I have been reading the SCIENTIFIC AMERICAN for several years and frequently I find items in it of more value than the year's subscription. In No. 9, present volume, you illustrated a plan for setting steam boilers. I was much pleased with it and showed it to a friend of mine who was about re-setting a 60-horse power boiler in his machine shop. He adopted the plan. Four week's use of the improved furnace proves all you claimed for it. My friend will be one of your new subscribers. I shall, in a few days, re-set my 15-horse power boiler according to the plan. Every live mechanic should take your valuable journal.

The Lamb Knitting Machine Manufacturing Co, Chicopee Falls, Mass., say:—

In payment of your bill please find inclosed draft, etc. Please insert our advertisement every other week hereafter. We are compelled to this being overrun with orders. Unless they hold up we shall be obliged to withdraw it entirely. So much for the advantages of your medium for advertising.

C. W. Le Count, Manufacturer of lathe dogs and steam engine governors, South Norwalk, Conn., writes concerning his advertisement in these columns:

What business I have I can trace three-quarters of it directly to your journal.

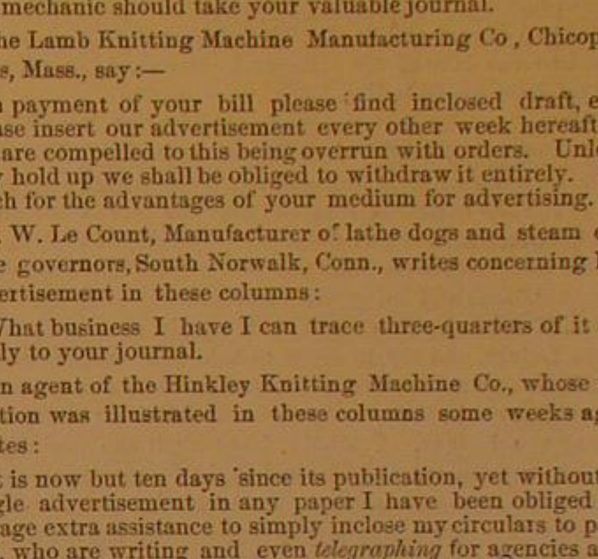
An agent of the Hinkley Knitting Machine Co., whose invention was illustrated in these columns some weeks ago, writes:

It is now but ten days since its publication, yet without a single advertisement in any paper I have been obliged to engage extra assistance to simply inclose my circulars to parties, who are writing and even *telegraphing* for agencies and machines, while many have traveled long distances to personally engage agencies. The Superintendent of the Company makes similar *complaints*.

HUNT'S IMPROVED STEAM PACKING PISTON.

Engineers are aware that there are more or less objections to the use of the ordinary spring pistons, owing to the changing tension of the springs, the necessity of frequent adjustment, and the impossibility of the packing rings adapting

Fig. 1



themselves to the varying pressures of the steam on the piston. A number of attempts have been made to produce a self packing or steam expanding piston, which will act always with the pressure of the steam and the velocity of the engine. The advantages of such a piston will be readily appreciated by practical engineers, especially drivers of locomotives, working, as they nearly all do, at a very high pressure of steam. The general complaint against the several packings in use on our railroads is, that they "pack too tight," and rapidly wear out the rings, while the only remedy has

Fig. 2

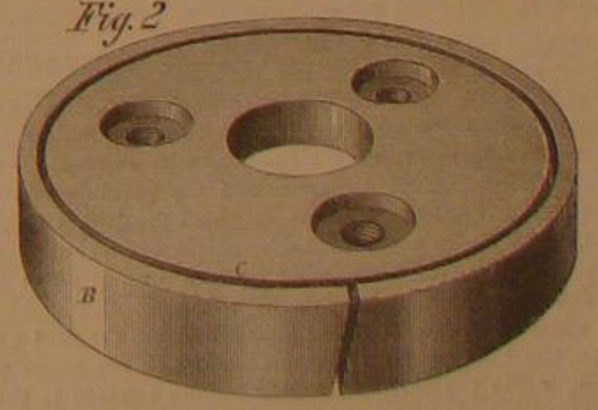
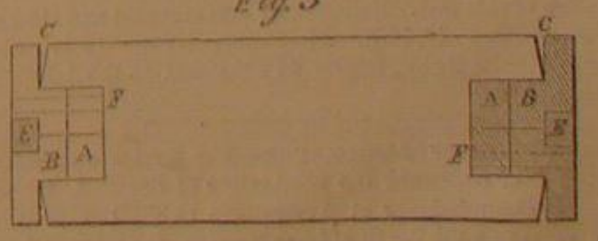


Fig. 3



been, the extremely uncertain one of contracting the openings by which steam is admitted under the ring, or rings, to expand them. The obvious objection to such an arrangement is, that it allows the steam to act on the rings with its full force during slow motion, as when a train is starting, while if effective under any circumstances, it will be so only at comparatively high piston speed. The efficacy of such a remedy, if it possesses any, is in fact inversely as the piston speed.

Fig. 1 is a perspective of the piston itself, or the "spider," with its follower and its rings removed, which are shown in Fig. 2. Fig. 3 is a cross section of another form of the piston, to be presently described, but which will serve to explain that shown in Figs. 1 and 2. Next to the core of the spider are two narrow internal rings, A, in Figs. 1 and 3; surrounding these two outer rings, B, the cross section of which is of L-form, as seen in Fig. 3. The lips of these outer rings extend to the whole thickness of the piston. The flange head of the piston, and also the follower, are turned beveling on their edges to admit the steam around the annular space thus formed under the rings, B. These spaces are plainly exhibited at C, in Figs. 2 and 3. Both inner and outer rings are adjusted to the bore of the cylinder by means of the gibs, D, and set screws seen in Fig. 1.

The section, Fig. 3, represents a modification intended for use in vertical cylinders, if considered necessary. The additional center ring, E, is intended to prevent leakage through the cut in the expanded ring and over the face of the unexpanded one, which might occur when the rings and cylinder should become so worn that the rings, when not expanded, should collapse and leave the surface of the cylinder. The rivets, F, shown by the dotted lines, are placed near the cuts in the L-rings, and are intended to hold the outside and inside rings together at that point, and prevent any tendency on the part of the latter to collapse and let steam under that part of the L-rings. Probably, however, if the packing is properly constructed and adjusted in the first instance, these devices will be unnecessary. In horizontal cylinders the weight of the piston, if properly supported on the set screws and gibs, will accomplish these objects, if the cuts in the L-rings are placed near the bottom side of the cylinder. The steam enters the annular space between the beveled edges of the spider flange and follower and the inner periphery of the overhanging part of the L-rings, and acts only on that part.

Patented by Nathan Hunt, Sept. 17, 1867. For further information address the patentee, or Sharps, Davis & Bonsall, Salem, Ohio, who will furnish piston heads to order on receipt of size of cylinder and piston rod.

Improvement in Hand Drills.

There are frequent occasions in a machine shop where light drilling is required on work it is inconvenient to bring to the lathe. For this the Scotch or ratchet drill, if the job is heavy, is employed, and if light, the breast drill. The placing and working of the former consumes considerable time, and the labor of drilling with the breast drill is excessive and exhausting. It is difficult also to hold the instrument so steady as not to cramp and break the drill. The combination of the drill with tongs and a pivoted bed piece, as seen in the engraving, obviates these objections.

NEVERGOLD & STACKHOUSE'S TONGS DRILL.

To the lower jaw, A, of a pair of tongs is pivoted a platen or bed, B, having a hole through its center, which is continued through the jaw for the passage of the drillings. The upper jaw is formed with a circular flange on which is mounted the circular or disk-like base, C, of the drill frame, D. This, with the frame, is secured on the jaw of the tongs by means of two screw bolts—one seen in the engraving—passing through the jaw and screwing into the base of the drill. These bolts pass through semi-circular or segmental slots, by which the drill frame can be swung around at different angles to the tongs, to adapt itself to the convenience of the workman and the requirements of the work. If desired, the crank by which the drill is driven may be used on the upright spindle, E. It will be seen that the pivoted base or bed, B, will allow the work to adapt itself always to the line of the drill.

In operation, the work being placed between the drill and platen, the left hand presses the handles of the tongs together, while the right turns the crank; the feed is thus graduated wholly by the pressure of the hand. No further description is required for understanding the construction or operation of this tool. Patented by F. Nevergold and George Stackhouse, June 19, 1866. Applications for the whole right, or for territorial rights, should be addressed to the latter at Pittsburgh, Pa.

Commissioner of Agriculture.—The Senate on Friday, the 29th ult., confirmed the nomination of the Hon. Horace Capron as Commissioner of Agriculture to fill the position made vacant by the death of Isaac Newton, the former head of the Department.

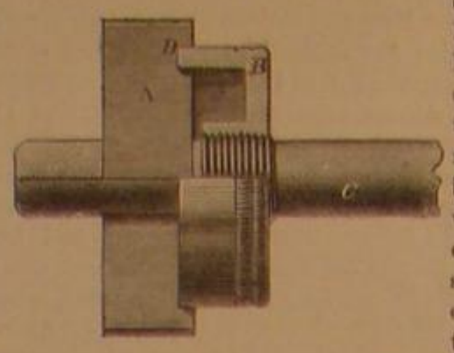
It is estimated that 10,000,000 feet of sawed lumber is frozen up in the docks at Bangor, Maine, three fourths of which is sold and waiting shipment.

Correspondence.

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

Improved Method of Securing Cutters on Boring Bars.

Messrs. Editors:—Thinking it may be of use to some of the readers of your invaluable paper, I have taken the liberty of sending you a sketch of a new mode of securing the cutter in a boring bar or pin drill. Where the cutters are secured, as usual, by a key, all mechanics know that it is very difficult to set a cutter twice alike; and the notch, which is filed in the cutter, to prevent it from moving endways, is a great source of weakness, often causing the cutters to crack in hardening, as well as after they are put to work. The inclosed sketch will explain itself:



A is a cutter, and B a collar, screwed upon the cutter bar, C. The edge of this collar fits into a notch on either end of the cutter, as shown at D, thus leaving the cutter as strong as possible at the center, and giving it a solid support at the point where support is needed, and at the same time insuring its always coming alike.

Brooklyn, N. Y. Theodore L. Webster.

[The device seems to be eminently well calculated for the support of the cutter on a boring bar, and is applicable, with but slight modification, to a pin or "teat" drill. Machinists will readily perceive its operation and excellencies.—Eds.

Tides and Their Causes.

The phenomenon of the daily tides of our seacoasts and tidal rivers is attributed to the attraction of the moon upon the earth—that the moon draws the earth towards it, and that in drawing the earth towards it, it bulges up the water of the ocean on the side presented towards the moon, and drawing the earth and water thus on that side, also draws the earth *away* from the water on the opposite side of it, and thus leaves the water bulged up on *that* side, and in doing all this the effect comes after the cause some three hours, which is termed "the tide lagging behind." Now if we knew, *per se*, what attraction of gravitation was, and that it produced this anomaly of force, there would be nothing to question in the matter. But as we only know by attraction that it means *drawing to*, it is impossible to reconcile the theory of the tides as they run to the attraction of the moon. If the moon is so potent in drawing up, why does it not draw a bulge on the inland seas—our great lakes? I will not discuss the question of the moon's Apogee and Perigee—its different velocities in different pasts of its orbit, as laid down by the law of Kepler, or whether it turns once on its axis in a month, or not, as either theory will answer for its phases, as well as for the face of the "Man in the Moon," but I will endeavor to give a more rational theory for the phenomenon of the daily tides.

The earth revolves on its axis and makes a revolution every twenty-four hours, and this moves its equatorial surface nearly a thousand miles per hour. Now the water on its surface, covering about three-fourths of it, and being more mobile than the solid earth, is, by centrifugal force, made to roll around the earth, the same as the water is made to move around the grindstone when in motion, a thing familiar to every body that uses that instrument. In the Southern Ocean this motion of the water is so well known to mariners who double Cape Horn in sailing from San Francisco to New York, that they now run considerably lower down in order to ride this tide eastward, than they did in former times. Here then we have one fact of water tide more comprehensive, at least, than the tractive theory of the moon. We have also the fact of two great promontories in Capes Horn and Good Hope, where this great tidal wave must strike against, and they produce constant oscillations of the water to and fro, and produce gurgitation and regurgitation in all the gulfs and rivers that line the coasts of the Northern, or more properly, the Land Hemisphere. These gurgitations swell the water highest in the places where the seas become the narrowest, as the more northern latitudes. In addition to these daily oscillations of the water, there are constant eddy currents, denominated "Gulf Streams," all agreeing in their courses and motion to this theory of the ocean tides.

When our present received tide theory of moon attraction was first laid down, the fact of the water of the great Southern ocean rolling round faster than the solid parts of our planets was not known. Smith, in his Physical Geography, says, "The tidal wave flows from east to west, owing to the earth's daily rotation in a contrary direction." Here he is unintentionally correct, because the water striking these promontories of the two great capes, is hurled back, and not, as he assumes, that the great ocean wave is moving from east to west. The United States government sailing charts lay down the fact of this great ocean wave moving from west to east, south of the capes, and the ships coming from the Pacific to the Atlantic ocean take advantage of this, and ride the sea at the rate of over twenty knots per hour, by following the routes laid down in Maury's charts.

The old philosophy of the crystalline spheres was not more at variance with the correct motion of the stars and planets, than the moon theory of the tides. In their dilemma to account for the retrograde motions of the planets, they denominated them wanderers, straggiers, because they would not march with the "music of the spheres." In the moon theory of the tides the lunar satellite is made to pull and push at one and the same time, which is entirely at variance with the philosophy of force.

There is nothing in the heavens, nor in the earth, that proves to us positively that the sun holds the planets, and the planets their satellites, by attraction, as we are taught that the moon attracts the water of our world. We see that all terrestrial bodies tend toward the center of the earth, and we call this gravitation; but we cannot see how a body moves around the earth without falling on it, by this law. We say in dynamic philosophy, that bodies move in the direction of least resistance, and *that* we can positively understand; but what force *per se* is, we do not know. It is always better for us to explain phenomena by positive known laws and motions, than by any that rest merely upon conjecture.

Lancaster, Pa. Jno. Wise.

The Great Hoosac Tunnel.

Messrs. Editors:—In No. 23, Vol. XVII., of your paper, is an article upon the Hoosac Tunnel, but made up from data nearly a year old, and consequently not correctly representing the tunnel as it is at the present time. Your conclusions of course were based upon the same data; but during the past year, and especially during the past five months, much greater progress has been made than ever before upon the work, and a knowledge of what has been done since the last report was issued will, I think, give you a different impression of the time required for its final completion.

Referring to the profile in that number of the Scientific American, the following are the distances to the various points where the work is being prosecuted:

Distance from east end to central shaft		12,837.264	feet.
" "	central shaft to west shaft	9,747.072	"
" "	west shaft to new shaft	265.000	"
" "	new shaft to well No. 4	629.150	"
" "	well No. 4 to pier*	1,572.825	"
" "	east end to pier*	25,031.341	"

* The instrument pier is 4 feet west of the present west end of the tunnel.

The following are the lengths of the headings at the various points of the work, Dec. 2, 1867:

Length of east end heading		4,608.000	feet.
" "	west shaft, east heading	1,302.000	"
" "	" " west heading	611.000	"
" "	west end heading	617.000	"
Total length of headings		7,038.000	"
Leaving		17,993.341	"

or 3,396 miles of heading yet to be made, of which 1,218.975 feet are between the west end and the west shaft, and 16,714.366 feet between the west shaft and east end of the tunnel.

The central shaft is down 583 feet, and well No. 4 is down 150 feet.

The progress for the month of November, 1867, was as follows:

East end heading	126.00	feet.
West shaft, east heading	33.60	"
" " west heading	5.00	"
West end	20.00	"
Total for the month of November	184.60	"

Thirty feet of brick arch were completed during the month at the west end, making a total of 516 feet of brick arch completed to date.

The progress for the last six months has been as follows:

East end	711.00	feet.
West shaft, east heading	216.00	"
" " west "	288.00	"
West end	180.00	"
Total, from June 1, to Dec. 2	1,295.00	"
" for the previous six months	632.00	"
" " " year ending Dec. 2, 1867	2,027.00	"

The new shaft has been sunk, and at its foot are the pumps which, together with those at the west shaft, are now throwing out between 900 and 1,000 gallons of water per minute.

During the last month great quantities of water were struck at both headings of the west shaft (70 gallons per minute at the east heading in one day), and the work was stopped in consequence, which accounts for the small progress at this point. A new pump of 1,000 gallons per minute capacity will be at work, in addition to the above, in a few days, and the work can then go forward with increased rapidity.

Well No. 4 is an artesian well, which is now being carried down as a shaft to afford two more faces to work from. Its depth will be, when finished, 215 feet, its dimensions 8 by 8 feet.

At the rate of progress for the past year it will require but eight years and ten months to pierce through the mountain

and at the rate for the past six months it will require but six years and five months. But when the central shaft and well No. 4 are sunk to grade the number of faces to work from will be doubled, and the time of completion thereby greatly diminished. At present drilling machines are employed only at the east end, but in a few weeks they will be used at the west shaft, and also at the central shaft as soon as the buildings and machinery are again in place, and this again will hasten the completion of the work. At the west shaft buildings are already erected for the manufacture of nitro-glycerin, and the use of this powerful explosive will be adopted during the present month. In fine, every means that will hasten the work will be employed, and ere the present generation passes away, and even within from four to seven years, trains loaded with freights and passengers will pass and repass through the great heart of the Hoosac Mountain as an hourly occurrence.

A. BEARDSLEY, C. E., Asst. Engineer.

North Adams, Mass.

Horse-hair Snakes--Wonderful Transformation.

MESSRS. EDITORS:—In No. 21, current volume, you referred H. K., of Wis., who had described the horse-hair snake, to page 280, No. 18 current volume, for a reply, which you considered "sufficient." With your kind permission I would like to speak a few words about the "snakes" in question. When I resided in Pennsylvania, I, in company with many other lads, used to tie a bundle of horse hairs into a hard knot and then immerse them in the brook, when the water began to get warm, and in due time we would have just as many animals, with the power of locomotion and appearance of snakes, as there were hairs in the bundle. I have raised them one-eighth of an inch in diameter, with perceptible eyes and mouth on the butt end or root part of the hair. Take such a snake and dip it in an alkaline solution, and the flesh or mucus that formed about the hair will dissolve, and the veritable horse hair is left. They will not generate in limestone water, only in freestone or salt water.

Covington, Ky. T. W. B.

Man Proposes, but God Disposes.

It may not be generally known that but for one of those accidents which seem to be almost a direct interposition of Providence, Prof. Morse, the originator of the magnetic telegraph, might have been now an artist instead of the inventor of the telegraph, and that agent of civilization be either unknown or just discovered. We publish from Tuckerman's "Book of the Artists" just from the press of G. P. Putnam & Son, the following reminiscence of Prof. Morse:

"A striking evidence of the waywardness of destiny is afforded by the experience of this artist, if we pass at once from this early and hopeful moment to a more recent incident. He then aimed at renown through devotion to the beautiful; but it would seem as if the genius of his country, in spite of himself, led him to this object, by the less flowery path of utility. He desired to identify his name with art, but it has become far more widely associated with science. A series of bitter disappointments obliged him to "coin his mind for bread", for a long period, of exclusive attention to portrait painting, although, at rare intervals, he accomplished something more satisfactory. More than thirty years since, on a voyage from Europe, in a conversation with his fellow passengers, the theme of discourse happened to be the electro-magnet; and one gentleman present related some experiments he had lately witnessed at Paris, which proved the almost incalculable rapidity of movement with which electricity was disseminated. The idea suggested itself to the active mind of the artist, that this wonderful and but partially explored agent might be rendered subservient to that system of intercommunication which had become so important a principle of modern civilization. He brooded over the subject as he walked the deck, or lay wakeful in his berth, and by the time he arrived at New York, had so far matured his invention as to have decided upon a telegraph of signs, which is essentially that now in use. After having sufficiently demonstrated his discovery to the scientific, a long period of toil, anxiety, and suspense intervened before he obtained the requisite facilities for the establishment of the magnetic telegraph. It is now in daily operation in the United States, and its superiority over all similar inventions abroad was confirmed by the testimony of Arago and the appropriation made for its erection by the French Government.

"By one of those coincidences which would be thought appropriate for romance, but which are more common, in fact, than the unobservant are disposed to confess, these two most brilliant events in the painter's life—his first successful work of art and the triumph of his scientific discovery—were brought together, as it were, in a manner singularly fitted to impress the imagination. Six copies of his "Dying Hercules" had been made in London, and the mold was then destroyed. Four of these were distributed by the artist to academies, one he retained, and the last was given to Mr. Bulfinch, the architect of the Capitol—who was engaged at the time upon that building. After the lapse of many years, an accident ruined Morse's own copy, and a similar fate had overtaken the others, at least in America. After vain endeavors to regain one of these trophies of his youthful career, he at length despaired of seeing again what could not fail to be endeared to his memory by the most interesting associations. One day he was superintending the preparations for the first establishment of his telegraph in the room assigned at the Capitol. His perseverence and self-denying labor had at length met its just reward, and he was taking the first active step to obtain a substantial benefit from his invention. It became necessary in locating the wires, to descend into a vault beneath the apartment, which had not been opened for a long period. A man preceded the artist with a lamp. As they passed along the subterranean chamber the latter's attention was excited by something white glimmering through the darkness. In approaching the object, what was his surprise to find himself gazing upon his long-lost Hercules, which he had not seen for twenty years. A little reflection explained the apparent miracle. This was undoubtedly the copy given to his deceased friend, the architect, and temporarily deposited in the vault for safety, and undiscovered after his death.

Extraordinary Effects of an Earthquake---An American Man-of-War Carried Over the Tops of Warehouses and Stranded.

[OFFICIAL REPORT.]

UNITED STATES STEAMSHIP "MONONGAHELA," ST. CROIX, Nov. 21, 1867.

SIR:—I have to state, with deep regret, that the United States steamship *Monongahela*, under my command, is now lying on the beach in front of the town of Frederickstadt, St. Croix, where she was thrown by the most fearful earthquake ever known here. The shock occurred at 3 o'clock, P. M., of the 18th inst. Up to that moment the weather was serene, and no indication of a change showed by the barometer, which stood at 30 degrees 15 minutes. The first indication we had of the earthquake was a violent trembling of the ship, resembling the blowing off of steam. This lasted some 30 seconds, and immediately afterward the water was observed to be receding rapidly from the beach. In a moment the current was changed, and bore the ship toward the beach, carrying out the entire cable and drawing the bolts from the kelson, without the slightest effect in checking her terrific speed toward the beach. Another anchor was ordered to be let go, but in a few seconds she was in too shoal water for this to avail. When within a few yards of the beach, the reflux of the water checked her speed for a moment, and a light breeze from the land gave me a momentary hope that the jib and foretopmost staysail might pay her head off shore, so that in the reflux of the wave she might reach waters sufficiently deep to float her, and then be brought up by the other anchor. These sails were immediately set, and she payed off so as to bring her broadside to the beach. When the sea returned, in the form of a wall of water 25 or 30 feet high, it carried us over the warehouses into the first street of the town. This wave in receding took her back toward the beach, and left her nearly perpendicular on the edge of a coral reef, where she has now keeled over to an angle of 15 degrees.

All this was the work of a few moments only, and soon after the waters of the bay subsided into their naturally tranquil state, leaving us high and dry upon the beach. During her progress toward the beach she struck heavily two or three times; the first lurch carried the rifle gun on the forecastle overboard. Had the ship been carried 10 or 15 feet further out, she must inevitably have been forced over on her beam ends, resulting, I fear, in her total destruction, and in the loss of many lives. Providentially only four men were lost; these were in the boats at the time the shock commenced. The boats that were down were all swamped except my gig, which was crushed under the keel, killing my coxswain, a most valuable man. During this terrific scene the officers and men behaved with coolness and subordination. It affords me great pleasure to state, that, after a careful examination of the position and condition of the ship, I am enabled to report that she has sustained no irreparable damage to her hull. The sternpost is bent, and some 20 feet of her keel partially gone; propeller and shaft uninjured. The lower pintle of the rudder is gone, but no other damage is sustained by it. No damage is done to her hull more serious than the loss of several sheets of copper, torn from her starboard bilge and from her keel.

She now lies on the edge of a coral reef, which forms a solid foundation, on which ways may be laid. She can thus be launched in 10 feet of water at 100 feet from the beach. Gentlemen looking at the ship from shore declare that the bottom of the bay was visible where there was before, and is now, 40 fathoms of water.

To extricate the ship from her position I respectfully suggest that Mr. I. Hanscom be sent down with suitable material for ways, ready for laying down, and india-rubber camels to buoy her up. I think there is no insuperable obstacle to her being put afloat, providing a gang of ten or twelve good ship carpenters be sent down with the Naval Constructor, as her boilers and engines appear to have sustained no injury. A valuable ship may thus be saved to the navy, with all her stores and equipments.

S. B. BISSELL, Commodore Commanding.

Rear-Admiral J. S. Palmer, commanding H. A. Squadron, St. Thomas.

THE survey of another trans-continental railway route, which shall follow mainly the 35th parallel of latitude, is nearly completed. Its projectors claim this as the most feasible one across the continent, and even if the northern and southern roads are constructed, this would still be the favorite popular thoroughfare, and the easiest and cheapest built.

THE CHILIAN GUN now being built at Pittsburgh, is 23½ feet in length, being two feet longer than the famous Rodman gun at Fort Hamilton, this harbor, but of exactly the same bore, twenty inches. Its greatest diameter is 5 feet 4 inches, its least diameter, 2 feet 9 inches. The gun is designed for garrison or naval service.

FROM lack of economy, in reduction of ores, it is estimated that the aggregate loss on the production of bullion in this country for the present year will reach the sum of $25,000,000.

Recent American and Foreign Patents.

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

WARDROBE.—Nathan Turner, West Lynn, Mass.—This invention consists in a movable or swinging arrangement of the sides and top and bottom, whereby they are folded upon each other, with grooves or strips in or upon the sides to support shelves when used as a closet or book case, and which shelves may be removed when used as a wardrobe.

AXLE BOX.—Henry B. Pitner, La Porte, Ind.—This invention consists of an iron thimble or sleeve provided on each end in the inside with a screw thread, into which are fitted ends of brass or composition, or other metal softer than iron, in such a way that said metallic ends will not turn in the box, and so that the axle bears only upon the softer metal.

SPRING FORMER.—George S. Long, Bridgeport, Conn.—This invention consists of a vibrating anvil or former, upon which the steel to be worked is placed, said former vibrating under a roller, said roller being hollow, and provided with holes or orifices through which water received in the shaft of said roller is distributed upon the heated steel.

DOOR-FASTENER.—Francis C. Levalley, Warrenville, N. Y.—The present invention relates to a fastener for doors more particularly, which, in the construction and arrangement of its parts, is simple, and most effective, and secure, when fastened.

ROOFING.—Orville Manly, Garrettsville, Ohio.—This invention consists of tiles saturated with raw coal tar, made in the same way as ordinary brick, having all the edges bevelled, being thicker at one end, and laid upon the roof with the thicker end towards the eaves, and the spaces between the tiles formed by the bevelled sides of the same filled with a cement made of raw coal and clay.

FOLDING BEDSTEAD OR CHIR.—H. S. Titcomb, Gloversville, N. Y.—This invention consists of the parts being attached to each other by pivots and hinges, whereby the same may be folded in upon the bed and clothing, and upon each other.

CAST METAL CASES FOR SPRING BALANCES.—John Chattillon, New York city.—This invention relates to a new manner of arranging the cast metal cases for spring balances, so that they can be made less expensive and simpler than they are now made, and consists in fitting the iron, to which the upper end of the spring is secured, directly through the upper head of the case, instead of using an additional head in the case for that purpose.

TWEERS.—John B. Himberg, Frederick City, Md.—This invention relates to a new tweers, which is so arranged that the center part or ring can be easily taken out, whenever desired, but not accidentally, by a hook or stirrer, and that it can be easily cleaned and taken apart whenever desired, and that it may conduct a strong blast of air to the fire.

PUNCH.—C. D. Flesche, New York city.—This invention consists in arranging a punch in such a manner that it consists of two parts, which are firmly connected together for cutting the metal, while for bending the same, an inner sliding punch will be moved out of the stationary cutting punch, thus making both operations by one instrument, and avoiding the removal of the article from the cutting to the bending punch, which was heretofore necessary.

RAILROAD CHAIR.—Leander Pollock, Matteawan, N.Y.—This invention consists in making the chair of two pieces, each piece consisting of one cheek and of a portion of the case. When the two pieces are connected, the base of one rests upon the base of the other, the line of division between the two bases being inclined so that as the rail presses upon the upper base, it will tend to force the same downward on the incline, whereby the two cheeks will be brought together.

FIRE LADDER.—Johan Blomgren, Galesburg, Ill.—The main feature in this invention is a telescopic tube, expanded or closed by a coil fitting within it, and worked by a toothed wheel.

HARVESTER.—Francis C. Coppage, Terre Haute, Ind.—The object of my invention is to render more simple and effective the machinery for operating and adjusting the cutter bar and the reel of harvesters.

BOAT-DETACHING APPARATUS.—David L. Cohen, Pensacola, Fla.—The object of this invention is to furnish a device by which a ship's boat can be readily shipped or launched at sea, without danger of capsizing or fouling.

DEVICE FOR HITCHING HORSES.—Samuel Galbraith, New Orleans, La.—This invention is a neat, cheap, and durable device, designed to be attached to halters used in hitching horses, mules, etc., to prevent their being thrown, hung, or injured.

HYDROSTATIC MACHINE.—Dr. J. R. Cole, Kenton Station, Tenn.—The object of this invention is to construct a machine which, by the application of but little power, will raise a stream of water to any desired hight, to furnish motive power for machinery or for other purposes.

FENCE POST.—Robert Ramsay, New Wilmington, Pa.—In this invention the bottom of the post is supported between two parallel sills a short distance from the ground, the post being dovetailed and held by keys passing across the sills, and being adjusted high or low, or at any inclination, by making the keys larger or smaller, or of different sizes.

SELF-LOADING EXCAVATOR.—Benj. Slusser, Sidney, Ohio.—In this invention a pinion, attached to the forward axle is made to elevate the plow, when desired, and at the same instant to ungear and stop the endless apron carrier that conveys the dirt from the plow to the cart. A new method of instantly unloading the cart, and setting it again to receive another load, is shown.

WASHING MACHINE.—J. Q. Leffingwell, Nevada, Iowa.—This invention relates to an improvement in washing machines, and consists of a vibrating semi-cylindrical box operated by a means of a lever handle and gearing.

SCAFFOLD FOR BUILDERS, ETC.—John E. Bliss, Oxford, Ind.—This invention has for its object to furnish an improved scaffold for the use of carpenters, masons, painters, etc., which shall be simple in construction, strong, durable and easily adjusted to any desired hight.

PLOW.—Harvey Briggs, Smithland, Ky.—This invention has for its object to furnish an improved plow for breaking up sod or prairie land, which shall be strong and durable in construction and effective in operation.

CORN PLOW.—John Snyder, Williamsfield, Ohio.—This invention has for its object to furnish an improved plow for plowing and hoeing corn, which shall be simple and strong in construction and will do its work well.

SELF-RAKING ATTACHMENT FOR REAPERS.—James H. Glass and Albert J. Glass, McGregor, Iowa.—This invention has for its object to furnish an improved attachment for reapers of that class in which the rakes act as beaters, in the place of a reel, and are made to descend occasionally to sweep the bundle from the platform, so that the third, fourth, sixth, or any other desired rake may sweep the platform and deliver the bundle.

SKY ROCKET.—John W. Hadfield, Newtown, N. Y.—This invention relates to a modification of an improvement in sky rockets for which letters patent were granted to this inventor bearing date Nov. 28, 1863. The original improvement consisted in a novel application of wings to the body or "carcass" of the rocket, whereby the use of the ordinary guide stick was rendered unnecessary and the rockets rendered capable of being packed for transportation much more compactly than when provided with sticks. The present invention also consists in a novel manner of attaching the wings to the body or "carcass" of the rocket, whereby the same advantage is obtained as hitherto, at a less cost of manufacture.

TAIL PIECE FOR VIOLINS.—James Thoms, South Boston, Mass.—This invention relates to a new and improved manner of attaching the E-string to the tail piece of a violin, whereby a comparatively small portion of said string is wasted in case of breakage.

HAME TUG.—James E. Covert, Townsendville, N. Y.—This hame tug, according to the present invention, is made of a strip of malleable iron or other suitable material, perforated or provided with V-shaped holes or slots having a center tongue piece, for the reception of a V-shaped block fixed at one end of the trace, by means of which block the trace is engaged with the hame tug, where through a suitably arranged spring slot that strikes against the end of the tongue to the said V-slots, the block is held firmly in place, and consequently the trace fastened to the hame tug.

CENTER BOARD.—F. J. McFarland, San Francisco, Cal.—This invention relates to the location of the center boards of boats and sailing craft of all kinds, but is designed more particularly for freight-carrying vessels. It consists simply in employing two center boards and locating the same at the extreme ends of the hull.

MUSICAL INSTRUMENT.—George W. Van Dusen, Williamsburgh, N. Y.—This invention consists in a novel connection and arrangement of levers and valves between the plane of movement of the perforated surface or surfaces, and an air chest or chests, and the keys or levers for opening the valves to the reeds or for operating any other mechanism suitable for producing tones, whereby through such perforated surface or surfaces the mechanism forming the connection between it and the sounding mechanism will be operated through the perforations to produce the sound or note or notes desired, of whatever length such notes or sounds are to be.

COMBINED SEAT AND DESK.—Rev. Allen H. Burn, May's Landing, N. J.—The present invention relates to the combination of a desk or lid with a seat or bench, such lid or desk being hinged to the back of the seat in such a manner as to be raised or lowered at pleasure, and when raised, supported in position by means of supporting bars properly applied thereto.

MACHINE FOR REFITTING CONICAL VALVES.—Charles F. Hall, Brooklyn, N. Y.—This invention relates to a device by which the conical stop valves of gas, steam, and water works may be refitted or repaired when from any cause they are rendered leaky and unfit for use.

GRAIN-BAND CUTTER AND FORK.—E. G. Bullis, Manchester, Iowa.—This invention has for its object to furnish an improved instrument by means of which the bands of the grain bundles may be cut at the same time that the bundles are pitched to the person who feeds them to the threshing machine, and by the same operation.

PROPELLING VESSELS, ETC.—Robert R. Spedden and Daniel F. Stafford, Astoria, Oregon.—This invention has for its object to furnish an improved means by which the motion of the waves may be used for propelling vessels or working pumps or other machinery.

MAILBAG FASTENER.—S. Denison, Portlandville, N. Y.—This invention has for its object to furnish an improved mailbag fastening by the use of which the mouth of the bag will be closed securely, and which may be operated, in closing and opening the bag, in less time and with less labor, than the fastenings now in use.

KNIFE AND FORK CLEANER.—John Merritt, New York city.—This invention has for its object to furnish an improved machine by means of which knives and forks may be quickly and thoroughly cleaned.

CHURN.—Thomas Bisbing, Buckstown, Penn.—This invention has for its object to furnish an improved churn conveniently and easily operated, and which will do its work quickly and thoroughly.

SAW BUCK.—Henry J. Dill, Cummington, Mass.—This invention relates to the manner in which a stick of fire wood, or cord wood, is held fast or secured in the saw buck for the purpose of sawing it into suitable lengths, and it consists in arranging adjustable toothed clamps for holding the stick, which clamps are brought in contact with it by bearing upon a treddle with the foot.

PLATFORM SCALES.—D. Hazzard, Milton, Del.—This invention relates to a new and improved method of constructing scales of the platform kind, and it consists in attaching a spiral spring to a spindle, to the top end of which spindle the platform is secured, and to the bottom end of which a rod and index finger is attached, so that when an article, to be weighed, is placed on the platform, the weight of the article will act upon the spring and be indicated by the finger.

WASHING MACHINE.—S. W. Curtiss, Sugar Grove, Pa.—This invention relates to a new and improved method of constructing washing machines, and consists in the arrangement of three fluted revolving rollers in a suitable washing box or vessel.

COMBINED TRY SQUARE AND BEVEL.—Samuel N. Batcheider, Prairie du Chien, Wis.—This invention consists in attaching the blade of a try square to the stock in such a manner that it can be set and fastened at any desired angle by operating a hook slide and set screws.

STEAM ENGINE.—J. F. Troxel, Bloomsville, Ohio.—This invention relates to a new and improved method of constructing steam engines, whereby the same are greatly increased in power and effectiveness, and consists in operating a number of pistons in one cylinder.

STOVE.—T. W. Wisner, Howell, Mich.—This invention relates to a new and improved method of constructing those stoves which are used for drying purposes, or for heating water, or steaming vegetables, and for all other purposes of a similar nature, and the invention consists in rendering the stove portable by providing for supporting the same on truck wheels, which allows of its being transported from place to place, as may be required.

FURNACE HOT-AIR BLAST.—Richard Long, Chillicothe, Ohio.—This invention relates to a new and improved method of constructing and arranging the air pipes for heating the air blast for furnaces for smelting and reducing the ores in the manufacture of iron, having particular reference to the materials of which the air pipe is formed, the method of its construction, and also to the materials and method of construction of the supporting walls.

PRINTING POINTERS.—R. W. Macgowan, New York city.—This invention relates to a new and improved application of pointers to printing presses for registering the sheets of paper as they are fed to the press. Hitherto these pointers have been operated automatically, from the running parts of the press, allowed to remain in an elevated or nearly upright position, and through the sheet until the fingers or nippers of the cylinder arrive in proper position to grasp the sheet, at which time the pointers are drawn down and the sheet released, so that it may be connected with the cylinder, and related with the same in order to receive the impression. This improvement consists in applying a spring or an equivalent weight to the pointers, the latter being pivoted at their lower ends, or attached to axes and all constructed and arranged in such a manner that the pointers will hold the sheets properly in position on the feed board, and the nippers of the cylinder allowed to draw the sheet off from the points on account of the latter yielding or being allowed to be drawn down under the slight pull of the sheet, the springs or weights throwing the points back to their original position as soon as the sheet is withdrawn.

CLEANER FOR LAMP CHIMNEYS, ETC.—R. B. Musson, Champaign, Ill.—This invention relates to an improved cleaner for lamp chimneys, bottles, and other hollow ware.

SAWYER'S RULE.—Thomas Carter, Louisville, Ky.—This invention relates to an improved sawyer's rule, and consists of a rule on which is a scale showing at a glance the number of boards or planks, of any desired thickness, which can be sawn from a log of any given diameter.

WINDOW SCREEN.—A. W. Griffith, Roxbury, Mass.—This invention relates to an improvement in window screens, and consists in a screen wound round a spring roller at foot of a window, and attached to the bottom of the lower sash so that on opening the window the screen opens with it, admitting the air but excluding insects, and on closing the sash the screen winds up itself.

SHOVEL PLOW, CULTIVATOR, ETC.—P. Atkinson Ross, Harveys, Pa.—This invention has for its object to improve the construction of single and double-shovel plows, cultivators, etc., to enable them to be readily adjusted for use upon sidehills or level ground, so that the handles may be secured in nearly a level position, while the plow is held in the best position for doing the work properly.

SKY ROCKETS.—John W. Hadfield, East Williamsburgh, N. Y.—This invention consists in dispensing with the long stick or guide which is now attached to sky rockets in order to insure a straight upward flight of the same in the air, and using instead a plurality of short guides, whereby several important advantages are obtained, to wit: the packing of the rockets in a small space, so as to economize in transportation, the forming of a stand or support for the rocket, so that no fixture of any kind will be required when they are to be fired or "set off," and lastly, the obtaining of an efficient guide to insure the straight flight of the rockets upward in the air.

CATCHING THE OXYDE OF ZINC.—G. C. Hall, Brooklyn, N. Y.—This invention relates to an improved means for catching the oxyde of zinc, as it escapes with the fumes and gases from roasting zinc, or zinc ore. Hitherto the oxyde of zinc has been caught and retained by forcing the fumes and gases from the roasting ore into a large bag or receptacle composed of cotton cloth or other porous material, which will admit of the gases and air passing it, but not the oxyde, the latter being retained within the bag, and, by its superior gravity, falling to the bottom thereof and settling in teats or pendent receptacles at the bottom of the bag, from which it is removed from time to time. This invention has for its object the dispensing with the large bag, which is very expensive—the gases from the ore affecting the same so that it rots in a very short time, and soon becomes ruptured under the blows which are given it to cause the oxyde which adheres to the sides of the bag to drop into the teats or receptacles made to receive it. The invention consists in having the fumes and gases from the roasting zinc or zinc ore forced into a close building, provided with openings or apertures, over which screens are placed, constructed in such a manner and of such materials as to admit of the air and gases passing through them, but not the oxyde.

FERRULE.—Archibald Shaw, Philadelphia, Pa.—This invention relates to a new and improved ferrule, for the handles of tools and other implements, and it consists in providing the interior of the ferrule with oblique spurs or projections, disposed or arranged in such a manner as to admit of the ferrule being driven on the handle and at the same time prevent it from casually slipping off therefrom. The object of the invention is to obviate the necessity of tacks or screws being used to secure the ferrule on the handle, as well as the pinching of the same externally to form a burr to sink into the handle to effect the same end.

SUCTION OR VACUUM PUMP AND BLOWER.—John Doyle and Timothy A. Martin, New York City.—This invention consists in arranging valves and air passages with a hollow cylinder or drum, having an oscillating movement, and provided with a chamber or chambers to receive water, mercury or other fluid, whereby an exceedingly simple and compact pump or blower is obtained, one not liable to get out of repair or become deranged by use.

MACHINE FOR REGISTERING NUMBERS FOR ODOMETERS.—Henry F. Hart, New York city.—This invention relates to an improved machine or apparatus for registering numbers applicable to odometers or measurements of quantities of all kinds, such as the numbers of barrels of flour, bushels of grain or any other commodity that requires a tally or record of the quantity packed, stored, weighed, or handled in any manner.

DITCHING MACHINE.—A. H. and P. S. Whitacre, Morrow, Ohio.—This invention relates to an improvement in the construction of a machine for cutting ditches suitable for laying tile for draining lands, or pipe of any kind, and consists in a sled worked by tackle and supporting a frame carrying the machinery, in such manner that the frame can be raised and lowered to cut the ditch to any required depth.

WINDOW SHADE RACK AND PULLEY FASTENING.—Wm. H. Woods, Philadelphia, Pa.—This invention relates to an improvement in constructing a fastening for window shades and consists in a metal rack to be attached vertically as usual to the side of the window frame for holding the cord connected with the shade by means of a lever dog that works in a longitudinal slot in the rack and is engaged and disengaged with the teeth thereof by moving the lever in and out of the slot to be secured in places when engaged by a swivel knob on which is a pulley that covers the cord of the shade.

FENCE POST.—Warren H. Shay, Sylvania, Ohio.—This invention relates to an improved method of constructing fence posts and consists in forming them of plank uprights supported by braces and held together by cross ties and keys.

CLOTHES-WASHING MACHINE.—John D. Swartz, Milton, Pa.—This invention relates to a new and improved clothes-washing machine of that class which are provided with an oscillating rubber and a concave of rollers.

RAILROAD RAILS AND CHAIRS.—John H. Downing, Salem, Mass.—This invention relates to an improvement in railroad rails and chairs, and consists in forming the rails in two parts, to lie side by side, with lap-joints combined with narrow chairs, having single heads placed on each side of the rail to clamp the two parts together at the joints, and fasten them to the ties.

MACHINE FOR STRETCHING CLOTH.—A. C. Corpe, Stafford, Conn.—This invention relates to a new and improved machine for stretching cloth, with a view of rendering the same smooth and enfolding such portion of the selvedges which may have been rolled over in the manipulations to which it was subjected after being taken from the loom.

MACHINE FOR SHARPENING SAWS.—E. B. Rich, South Boston, Mass.—This invention relates to a machine for the sharpening of saw blades, whether straight or circular, and consists in the combination of a revolving or rotating grinding wheel, made of any suitable material, and a holder for the saw-blade, so arranged together that as the grinding wheel revolves the saw will be presented to the same, or the wheel to the saw-blade, in such a manner as to produce the desired sharpening of the teeth, in regular order and succession.

DOOR SPRING.—Rudolph Schrader, Indianapolis, Ind.—The present invention relates to a spring for doors, that being properly connected with the door will operate to close, whether when opened it swings inside or outside through the casing to the door, the spring being especially applicable to doors hung to swing through their casing, or inside and outside.

PORTABLE DERRICK.—D. J. McDonald, Gold Hill, Nevada.—This invention relates to a new and improved derrick, and it consists in a novel construction and arrangement of parts, whereby the device may be readily drawn from place to place, the crane or derrick frame adjusted in any desired position within the scope of its movement, friction avoided, and the whole apparatus manipulated with the greatest facility.

Answers to Correspondents.

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

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

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

J. F. McK., of Md.—"What kind of silk is used for balloons, what is the varnish which covers them, and what amount of common illuminating gas will support one pound weight?" Silk for large balloons is now rarely used, stout cotton cloth being substituted. Ordinary boiled linseed oil makes a good varnish. Any elastic varnish will do, however. The specific gravity of ordinary illuminating gas ranges from 0·540 to 0·700, air being 1·000. Its weight may be called one-thirty-second of a pound to the cubic foot and atmospheric air about three-fourths of a pound.

R. B. C., of Pa., says: "Here is a proposition in geometry which I would like to see demonstrated theoretically by one of your correspondents. The side of a regular heptagon is equal to half the side of an equilateral triangle inscribed in the same circle. The mechanical construction is very simple and will be found useful. I discovered it some years ago, and am not aware of its ever having been in print."

F. H., of Mich., asks "if sal-soda will scale a boiler?" H. N. Winans, 11 Wall street, N. Y., replies that in some waters it is partially effective but at the expense of the boiler, with a certainty of foaming and corrosion. The most reliable and positively uninjurious remedy for incrustations is his anti-incrustation powder—in successful use for 12 years past.

T., of R. I., speaks of the famous mechanical horse shown at the Paris Exposition which is said to have accomplished with its rider a little over an English mile in fifty seconds, and asks what is the motive power. As it is said that the French Government took possession of the machine and preserves its mechanical construction a secret, we know no more about it than about the much vaunted Napoleon cannon.

S. S., of N. Y.—"Please give the ingredients of the composition used for tipping matches." Different manufacturers employ different materials and in varying proportions; the mixture of phosphorus melted and stirred up with thin glue is sufficient, although some add a quantity of powdered glass, niter, chlorate of potash, sulphur, etc. The phosphorus, however is the light-producing material.

R. S. B., of N. Y., alluding to the inquiry of S. W. P., in No. 25, for a water-proof paste: "Calico printers when they wish to leave white figures on a dark ground use what they term a 'resist paste' to cover such places as are designed to be unaffected by the dye. If the ingredients of this paste were known it might be what S. W. P., desires." This "resist paste" is 1 lb. of binacetate of copper (distilled verdigris), 3 lbs. sulphate of copper dissolved in 1 gal. water. This solution to be thickened with 2 lbs. gum senegal, 1 lb. British gum and 4 lbs. pipe clay; adding afterward, 2 oz. nitrate of copper as a deliquescent.

M. A. H., of Vt.—"I have a surplus of water power and desire to know the probable cost of the apparatus for producing the electric light, with a view of employing my surplus power in that direction.' A serviceable magneto-electrical machine for giving light is quite expensive.

Business and Personal.

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

Parties in want of Fine Tools or Machinists' Supplies send for price list to Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Pattern Letters and Figures for inventors, etc., to put on patterns for castings, are made by Knight Brothers, Seneca Falls, N. Y.

Allen & Needles, 41 South Water street, Philadelphia, Manufacturers of Allen's Patent Anti-Lamina, for removing and preventing Scale in steam boilers.

All Parties having any article to sell through an agent, address, with circular, etc., Box 499 Oil City, Pa.

Manufacturers of Tag Holders will please send address to Box 1019, St. Paul, Minn.

Manufacturers of Presses for making Castor Oil, address or send circular to F. M. Peck, P. O. Box 190, Montgomery, Ala.

Manufacturers of Cotton-Spinning and Knitting Machinery send circular and price list to W. L. Jones, Holly Springs, Miss.

Dr. W. Spillman, Marion Station, Miss., wishes to correspond with manufacturers of buckshot or bullets, either conical or spherical.

Toy Makers—One-half of Patent Right of Toy Wind Wheel given away! Address Dr. W. H. Benson, Norfolk, Va.

Milton Darling, East Macdonough, Chenango Co., N. Y., wishes the address of those that want broom handles for the year 1868.

A. B. Woodbury, Winchester, N. H., wants to sell two valuable patents—Jack-Spinning Improvements.

E. C. Tainter, Worcester, Mass., wants to sell a good set of Sash and Door Machinery, used only six months.

Parties desiring any of their new ideas put into practical form, or wanting any new apparatus invented for manufacturing purposes, etc., address, with confidence, A. E. W., Inventor and Draftsman, 114 Fulton street, N. Y. References given.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

For the benefit of the Union Pacific railroad, the base of the Rocky Mountains has been fixed at the base of the Black Hills, a distance of 6·677 miles west of Cheyenne, and, according to the railway surveys 525·078 miles from Omaha.

The Pittsburg, Fort Wayne and Chicago railway have just re-built in the most permanent manner an iron bridge over the Alleghany river, to replace the old wooden Howe truss bridge, which had become inadequate to the increasing traffic. The new bridge opens like a fan towards the freight yard at Pittsburg being at the narrowest part, next to the main span 55 feet wide. The river is crossed with spans averaging 153½ feet in the clear, with a bearing of five feet on each pier. The principle of the construction is known as the lattice girder plan, with vertical stiffening. The work was executed under the superintendence of its designer, the engineer and architect of the company Felician Stataper.

The production of precious metals in the United States from 1849 to 1867 inclusive, has amounted in value to $1,174,000,000.

The president of one of the New Jersey railroads proposes a plan to avoid the danger to life and limb from the series of trains that run into and out of Jersey city. The new project is to elevate the present tracks fifteen feet above the streets, and by safe machinery to lower at once an entire train in the depot at the river.

A mining company at Newton, Nev., are making preparations to work their claims by means of a steam engine which will be used to throw a stream of water instead of the ordinary hydraulic pressure. They estimate that with a ten or twelve horse power engine, they can throw 100 inches of water with a force equal to at least 150 feet fall. The result of this experiment is looked upon with a good deal of interest, as there is a vast amount of good hydraulic ground in the adjoining countries, which, as in this case, cannot be worked by the ordinary process for want of water fall, but which, if the expedient in this case proves successful, will soon be worked by steam engines.

By an oversight in the article on the trans-continental railroad, published in our last issue, the Western or California section of the road was styled the Union Pacific, instead of the Central railroad. In the race to reach Salt Lake the California company have 400 miles more to build, while the Union company have only 328 miles. But the country to be traversed by the former is comparatively level, and favorable for winter work, while that on the other side crosses four distinct mountain ranges, and winter storms must interrupt work for several months in the year.

PATENT OFFICE DECISIONS ON APPEAL.

USEFUL COMPOUNDS ARE PATENTABLE—THE APPLICANT NOT REQUIRED TO PROVE THE FUNCTION OF EACH INGREDIENT.

S. H. HODGES for the Board of Examiners-in Chief.

Application of Rew for a Patent for Preventing and Curing Swine Cholera.—The applicant's specific is composed of a number of medical articles, the nature of which is not important upon the present occasion, and it is unnecessary to enumerate them. But it is objected that "a medical prescription" "should contain some recognition of the medicinal properties of the several ingredients" "and the part they perform in the compound;" or, as it is elsewhere expressed, such a mixture should not receive the sanction of this department "unless perhaps a satisfactory rationale should be given for the use of each of the ingredients in the proportions named."

If the medical faculty were always satisfied themselves as to the operation of the various remedies they employ, there might be more reason in the objection. But it is well known that different schools disagree widely on this subject, and there are remedies employed with success the effect of which the most intelligent are unable to account for. So long as there is a single one of this character to be found, and while the operations of the vital functions are so concealed from us that we are unable fully to comprehend the process by which any specific operates, so long it is impossible to prescribe as a conditon of patentability, a full explanation of the mode in which any one acts that is brought forward. It would be still less justifiable to require such an explanation as would content any particular class of medical men. Every year new therapeutics are introduced into practice, and not unfrequently some whose beneficial results are not understood. And as long as one such may be found, it is not just to make it a condition of its being protected by a patent, that the discoverer should bring the scientific world to agree with him in his theory respecting it, nor even that he should have one.

The man who stumbles upon a new and useful article is just as much entitled to the exclusive use of it as if he had elaborated it by the most profound and painful study. It is true that there is danger upon this principle of countenancing mere nostrums, and giving them undue prestige. This can only be guarded against by the exercise of great caution, and requiring convincing proof of utility. Such has been furnished in this case, in abundance.

The application cannot be rejected except upon such grounds as would insure the rejection of nearly all medicines whatever. Nor is the Office responsible for the false importance which the public may attach to its proceedings, so long as they are confined to its legitimate province. Its duties certainly must not be neglected, and meritorious petitions refused, in order to obviate such misapprehensions.

The decision of the Primary Examiner is reversed.

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